Year Four and there was a rainfall event in this time period (figures 87, 88, and 89, pages 130 - 132). There is a small flow in September but the major flow is in October in association with a major rainfall event.

**C-111 Analysis of Operations**

See L-31N analysis section for a discussion of S-176. The minimum monthly delivery schedule for Eastern Panhandle through S-18C remained in place during Test 7. Water supply releases were made in February 1996 and March 1996. Generally the minimum monthly discharges are made at the end of a month. This is in order to take advantage of any rainfall events. In the case where there has not been input via rain, then the water delivery is made via C-111 structures. It should be noted that during February and March, S-18C was opened while S-176 and S-177 remained closed. This would lead to a recommendation to either modify the minimum delivery schedule, or make every effort to ensure that water deliveries are made by bringing water into the system through upstream structures (see SFNRC Section C-111 for additional information concerning the minimum monthly delivery scheduled for the Eastern Panhandle).

Discharges through S-197 were made during November 1995, June, July, and October 1996. During Year One of the Test 7, the operational criteria for closing S-197 was examined after the October 1996 operations associated with Hurricane *Lili*. The concern over closing criteria was raised due to concerns of over drainage in the surrounding marshes including lower Taylor Slough. Based on a review of the events after the threat of Hurricane *Lili* had passed, the SFWMD, ENP, and USACE determined that during further events which required the operation of S-197, close coordination between the agencies would be made in order to close the structure as quickly as possible. (See SFNRC Section C-111 for additional information concerning the S-197 and the C-111 area.)

Table 16 (page 133) shows the average monthly headwater and dry and wet season stage levels at S-177 for each of the four years in Test 7. The dry season stage levels for the four years was between 3.0 and 3.4 feet. The wet season stage level was between 3.7 and 3.9 feet. This compares to the S-177 criteria of maximum stage level of 4.2 feet and the minimum of 3.6 feet. Dry season averages below the minimum. Table 17 (page 133) is the S-18C monthly average, dry season average and wet season average stage levels. The dry season average of the four years of Test 7 was between 2.1 and 2.5 feet and the wet season average was between 2.4 and 2.6 feet. The maximum stage is 2.6 feet and the minimum is 2.3 feet. The higher wet season averages were within the criteria but the dry season average dropped below the minimum.

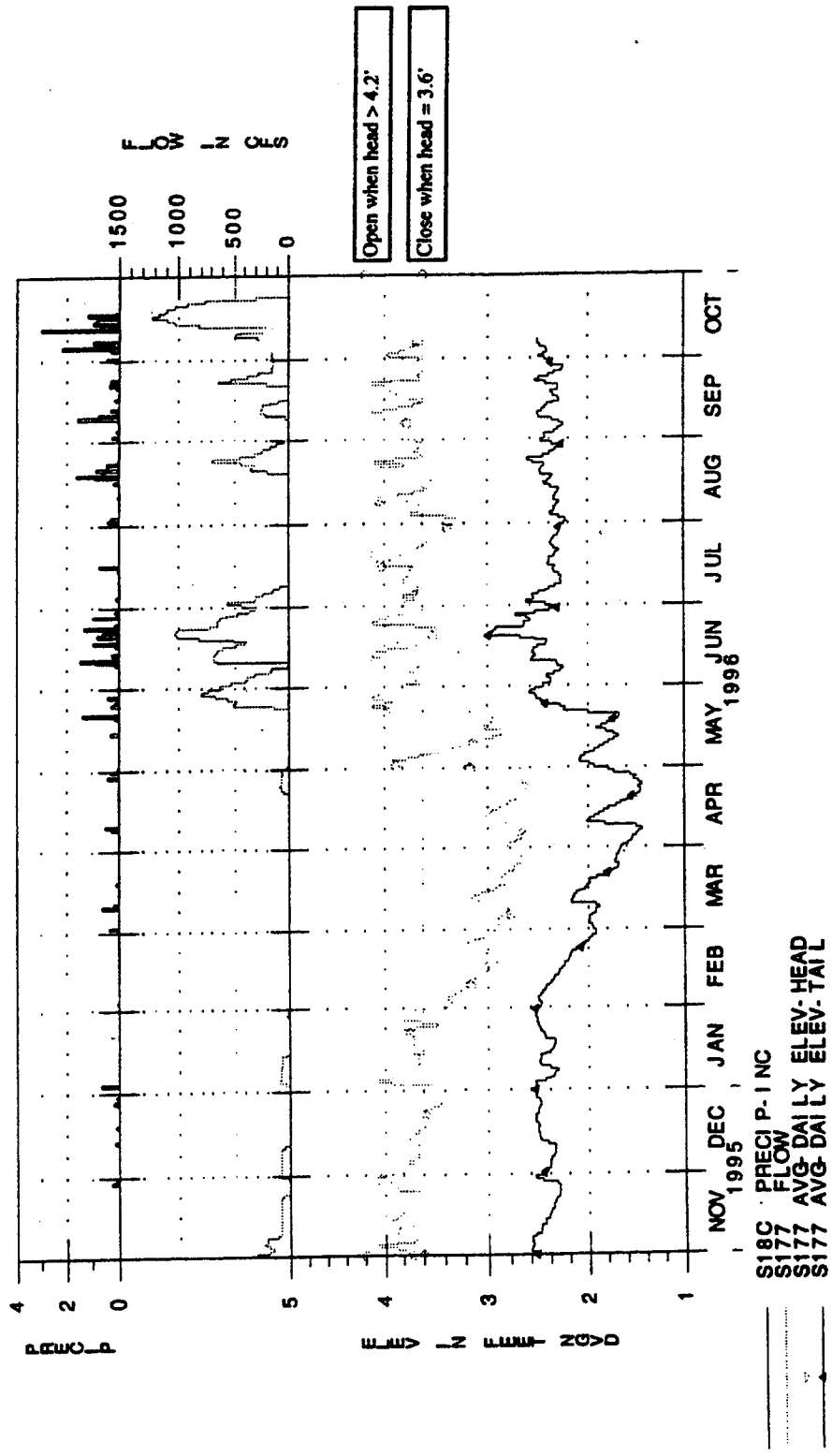



**Figure 70. S-177 Stage Hydrograph, Headwater and Tailwater Operational Criteria, Year One Test 7**

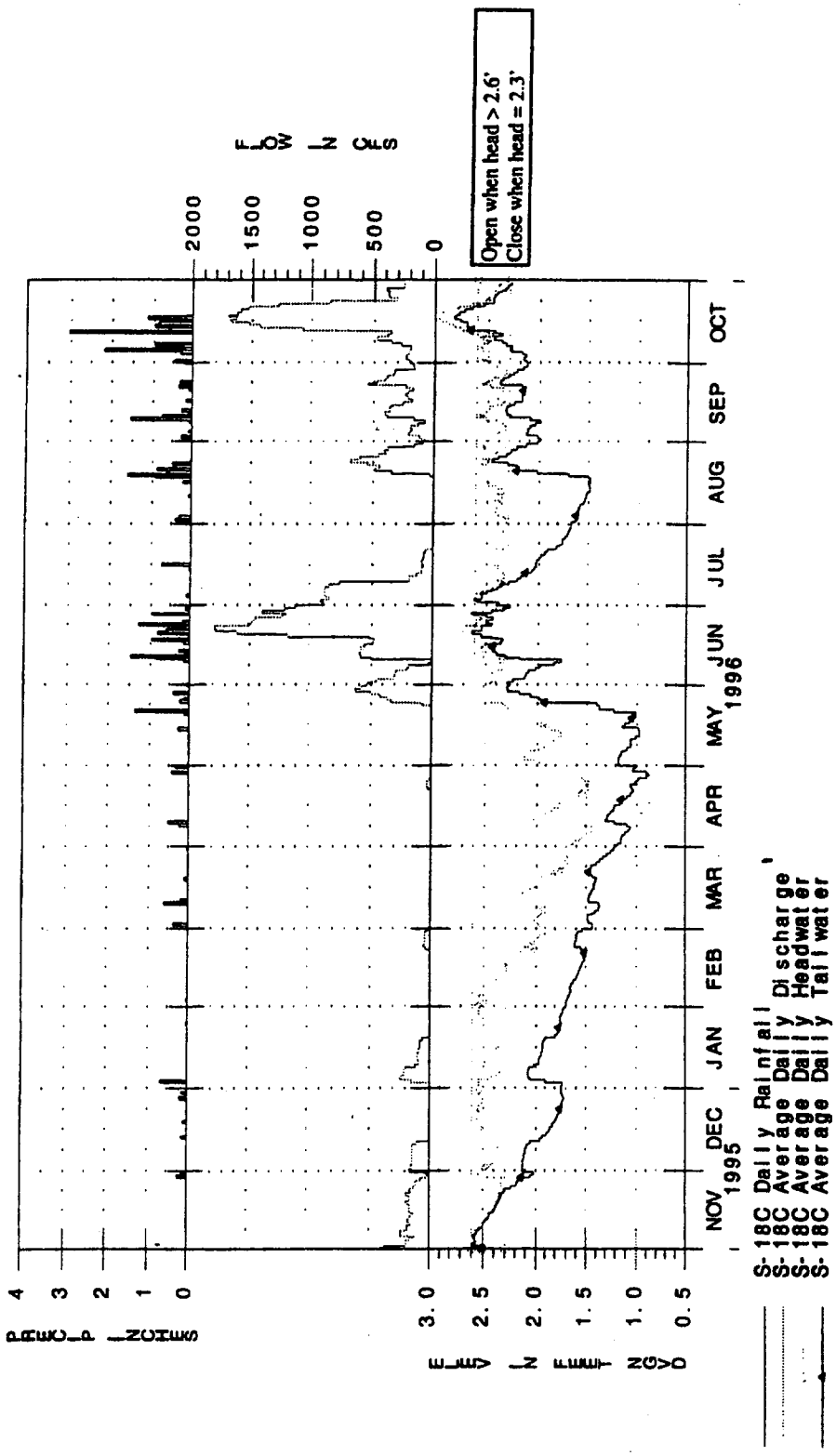



**Figure 71. S-18C Average Daily Flow, Average Daily Stage Levels, Headwater and Tailwater, Year One Test 7**

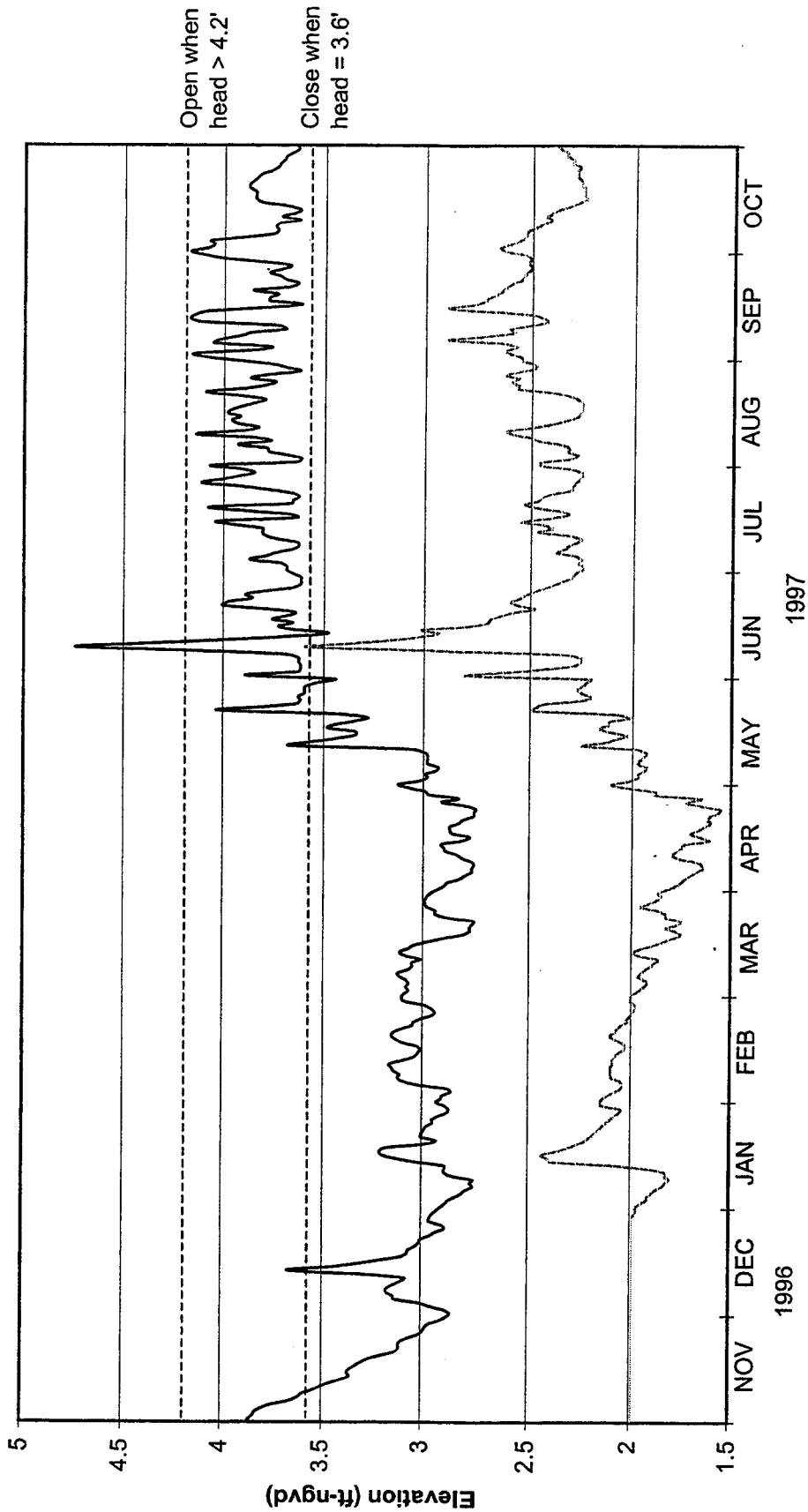



**Figure 72. S-177 Stage Hydrograph, Headwater and Tailwater Operational Criteria, Year Two Test 7**

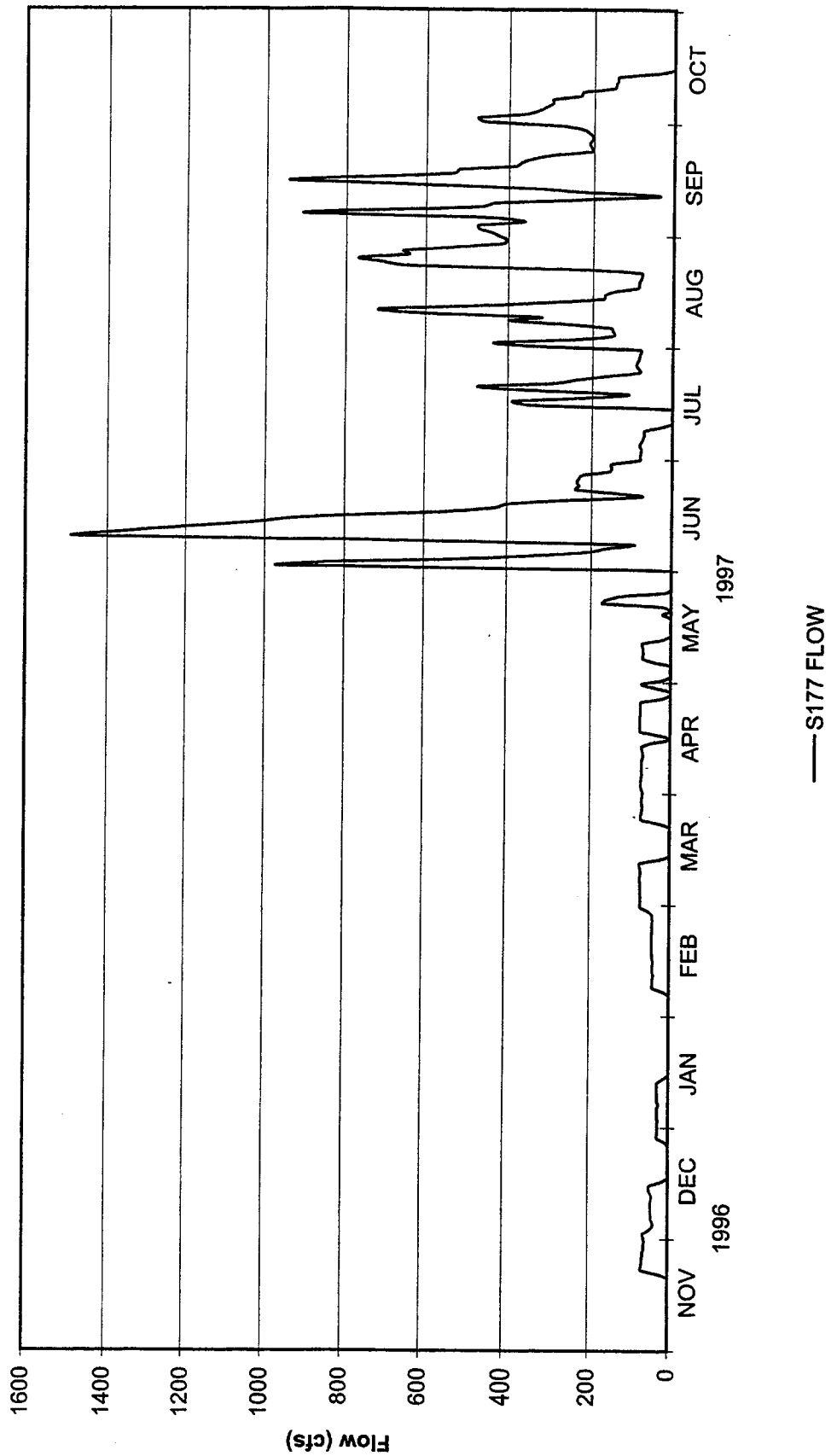



**Figure 73. S-177 Daily Flow in CFS, Year Two Test 7**

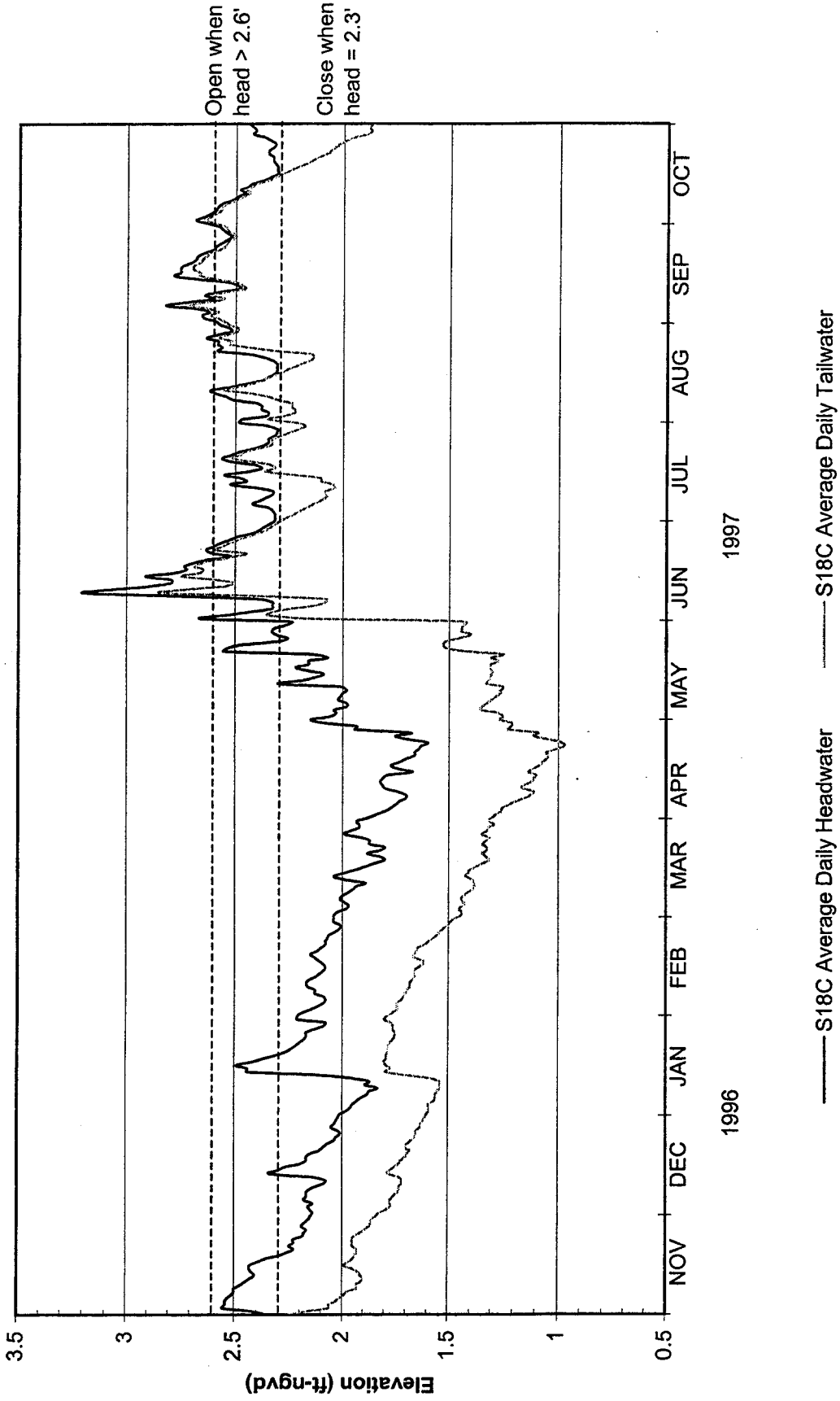



**Figure 74. S-18C Average Daily Stage Levels, Headwater and Tailwater, Year Two Test 7**

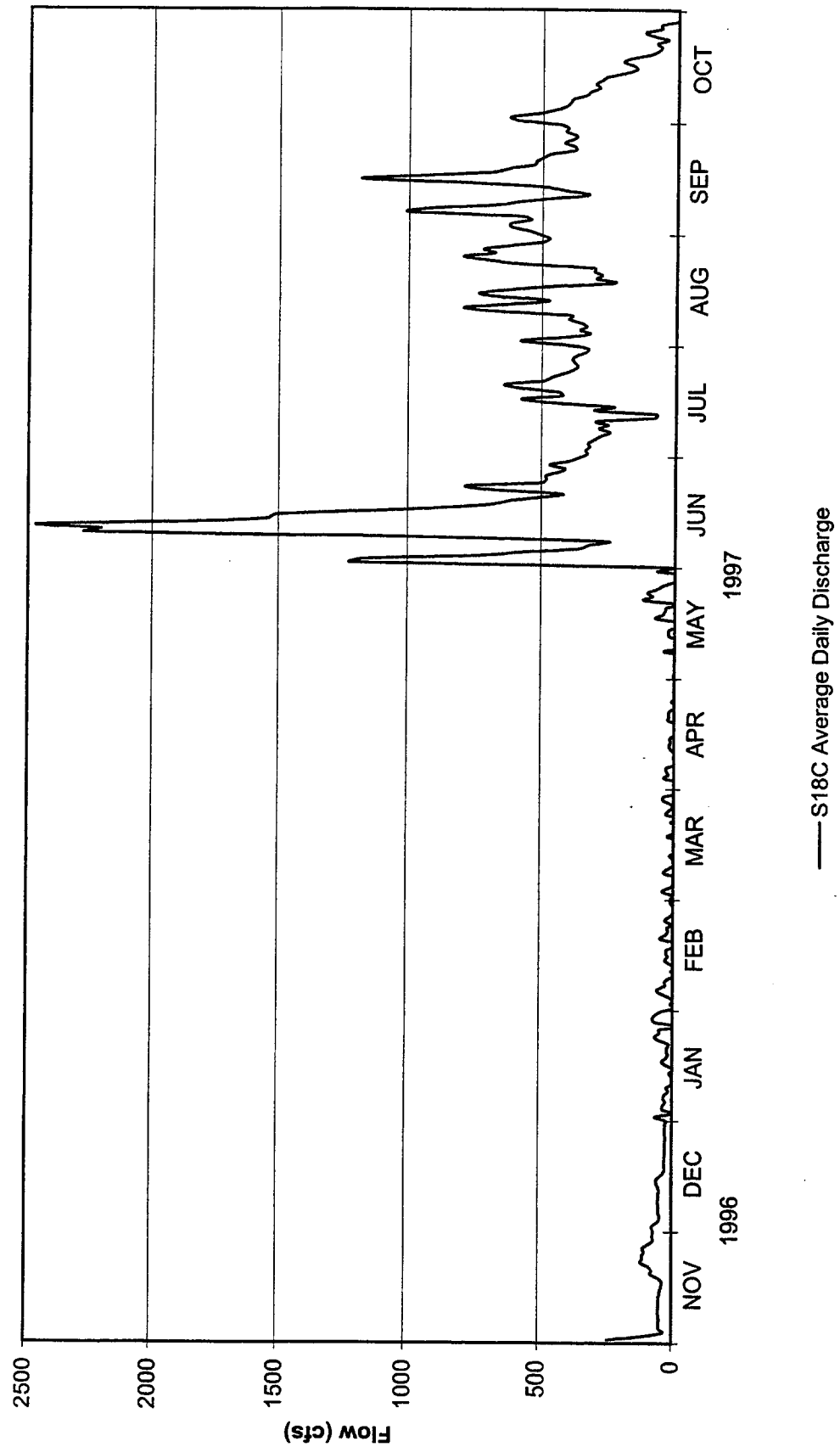



**Figure 75. S-18C Average Daily Flow in CFS, Year Two Test 7**

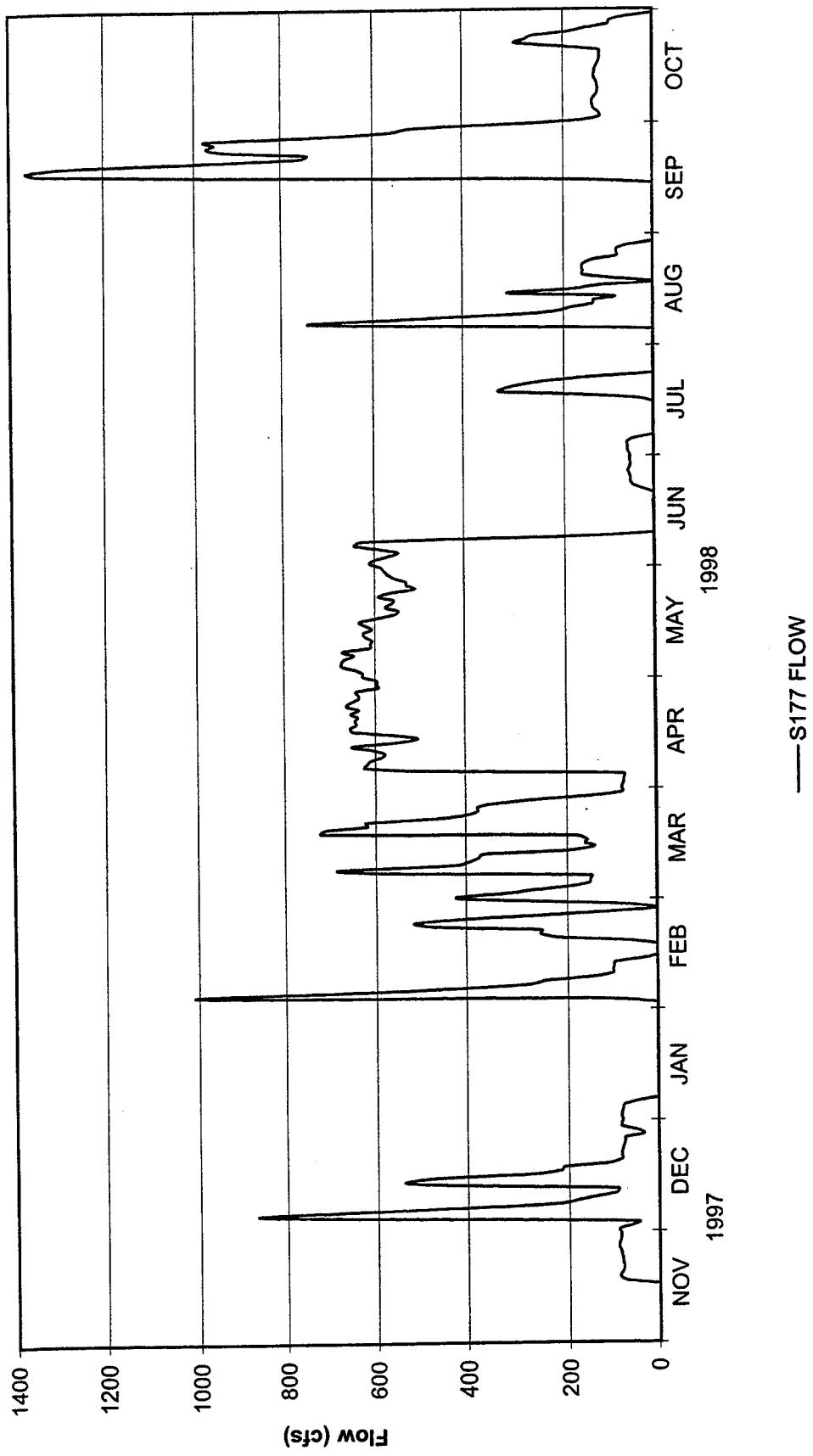
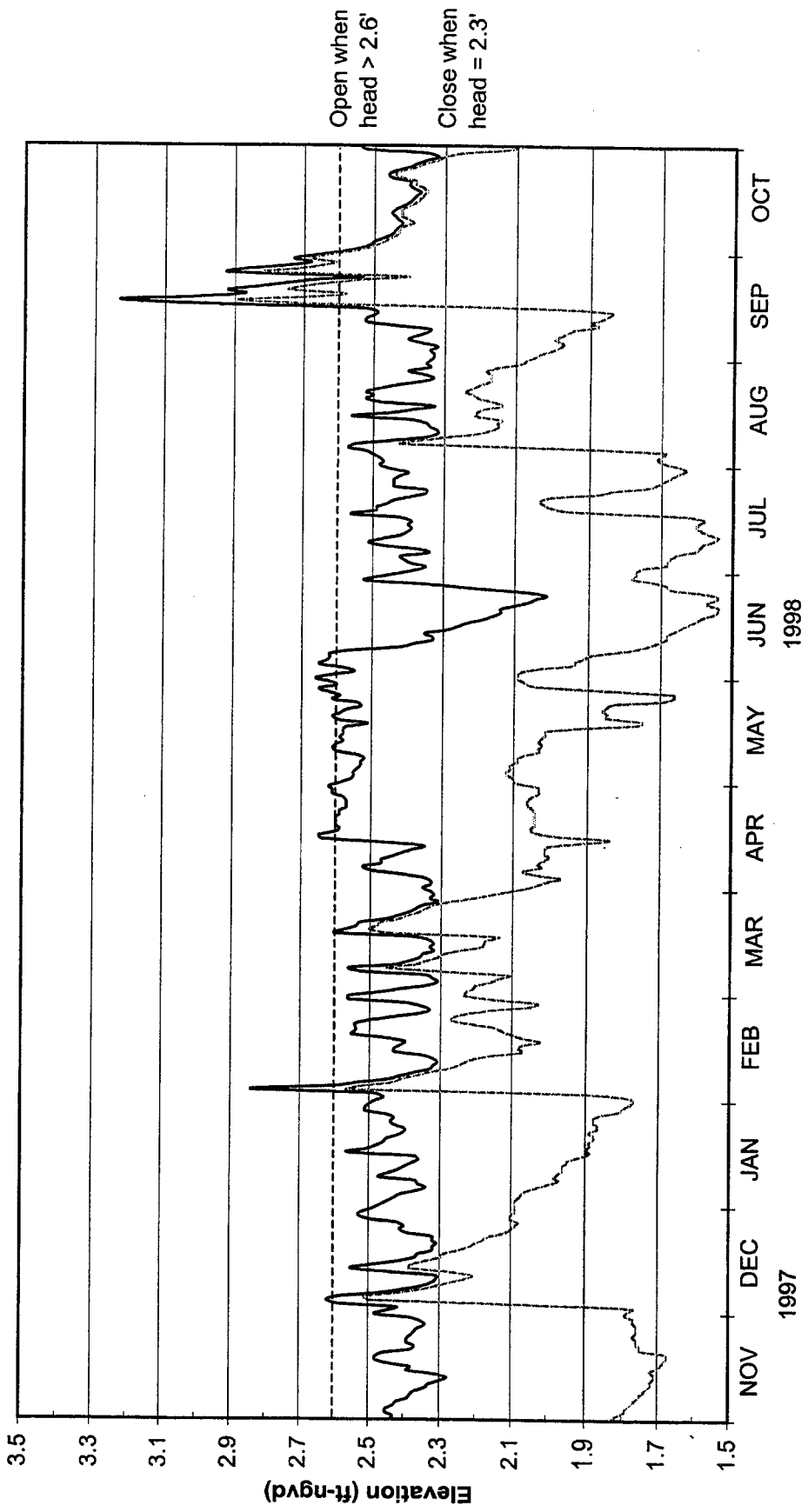



**Figure 76. S-177 Daily Flow in CFS, Year Three Test 7**

**Figure 77. S-18C Average Daily Flow, Average Daily Stage Levels, Headwater and Tailwater, Year Three Test 7**



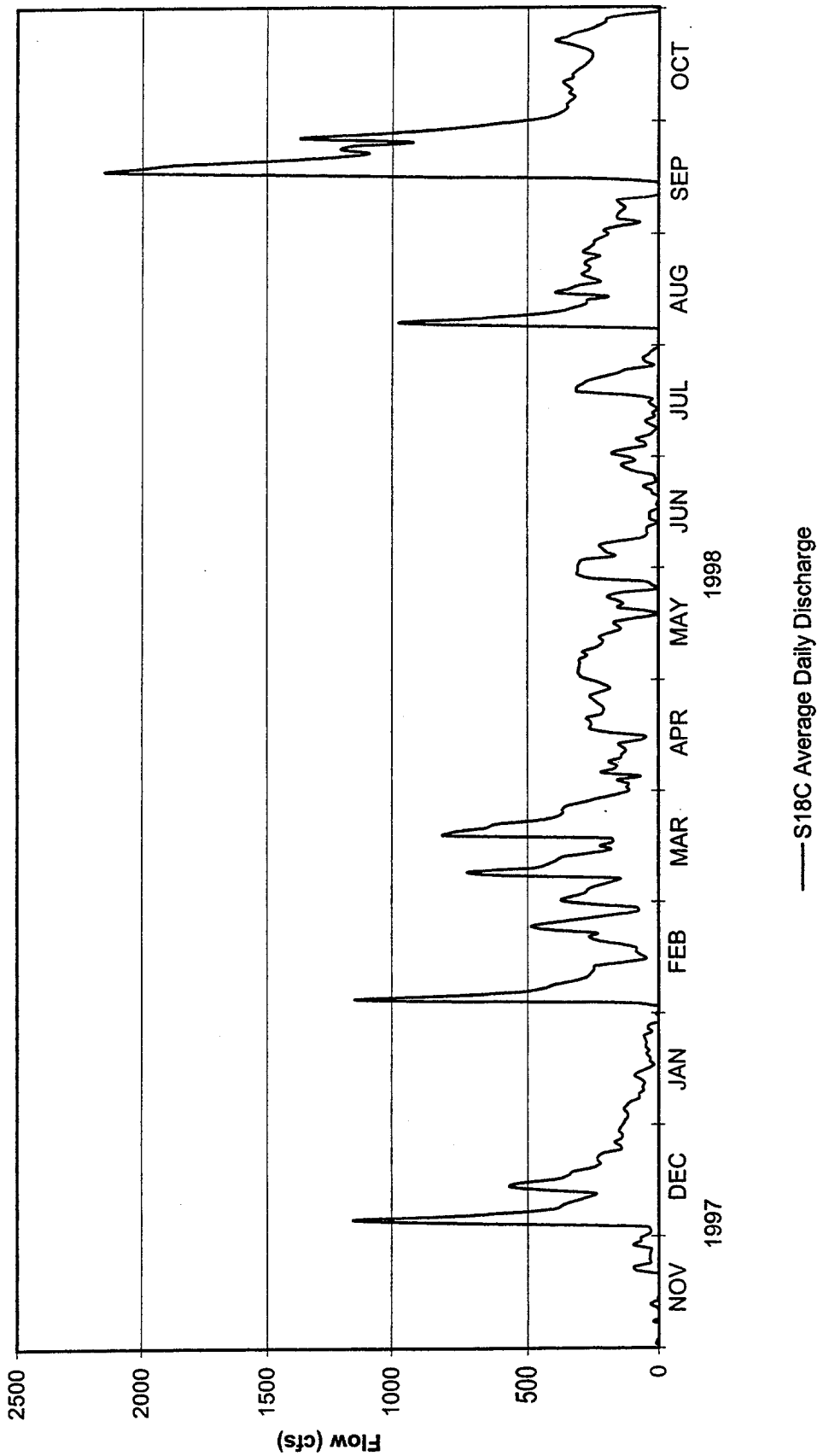



**Figure 78. S-18C Daily Flow in CFS, Year Three Test 7**

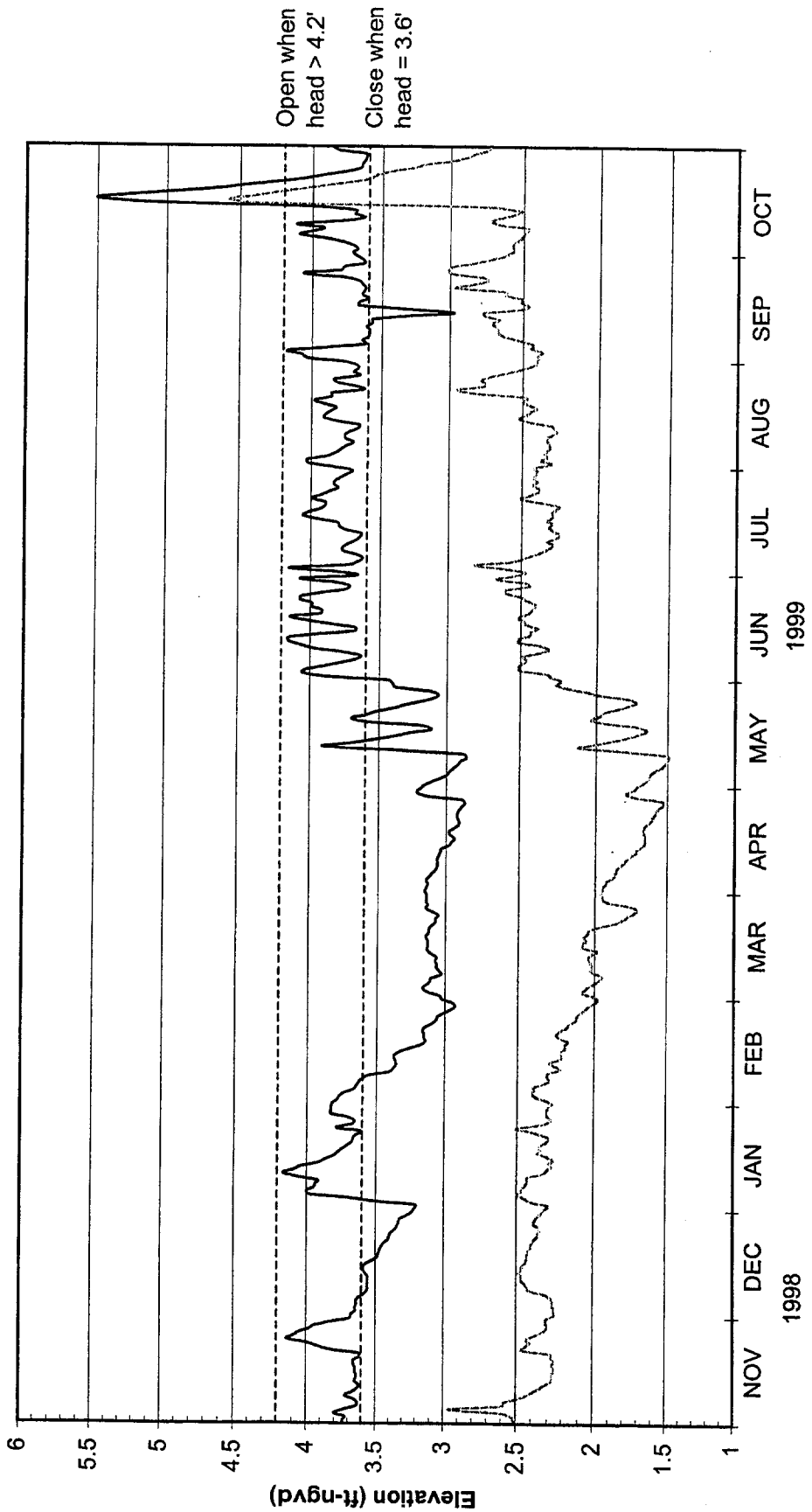



**Figure 79. S-177 Stage Hydrograph, Headwater and Tailwter Operational Criteria, Year Four Test 7**

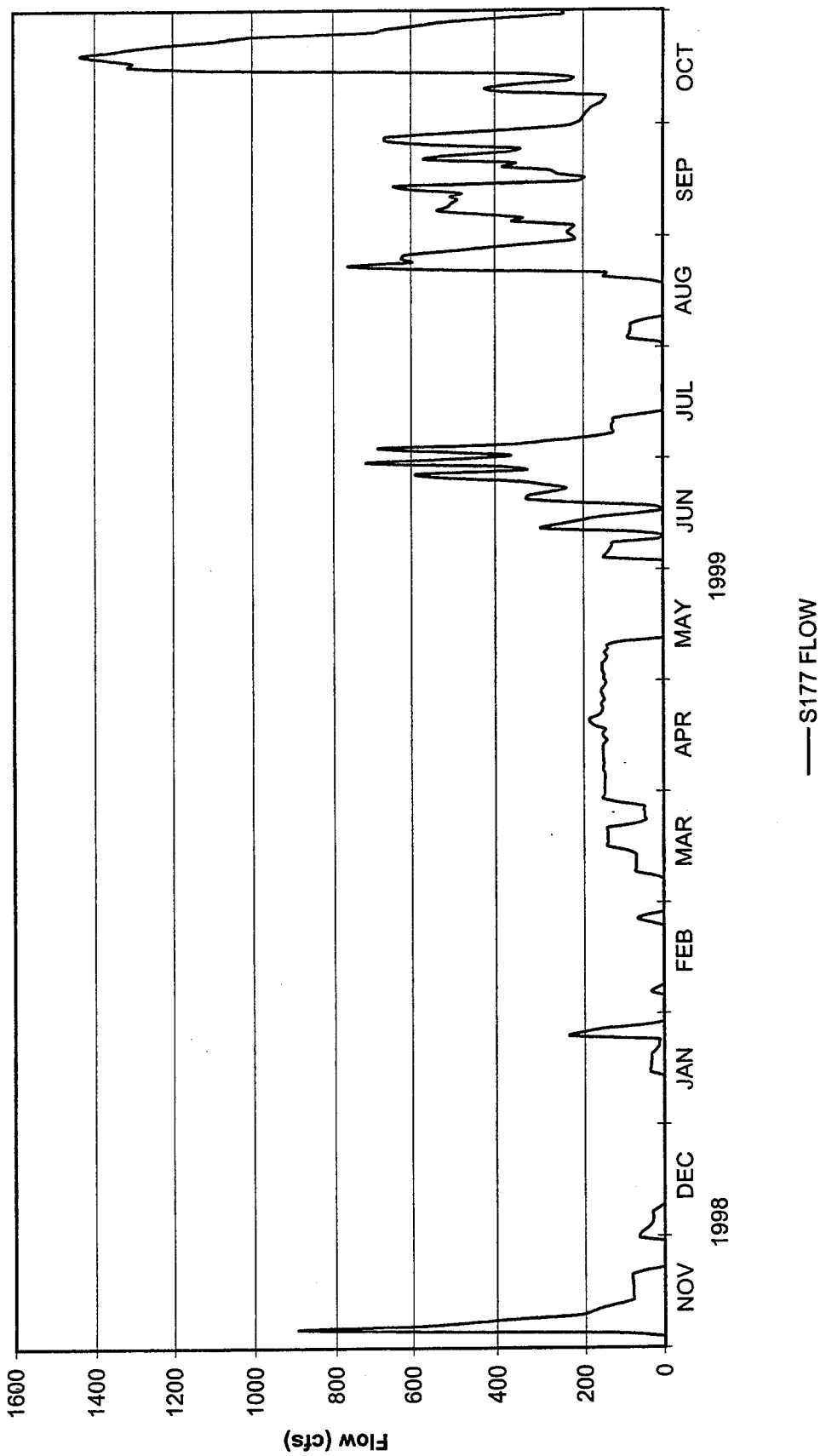



**Figure 80. S-177 Daily Flow in CFS, Year Four Test 7**

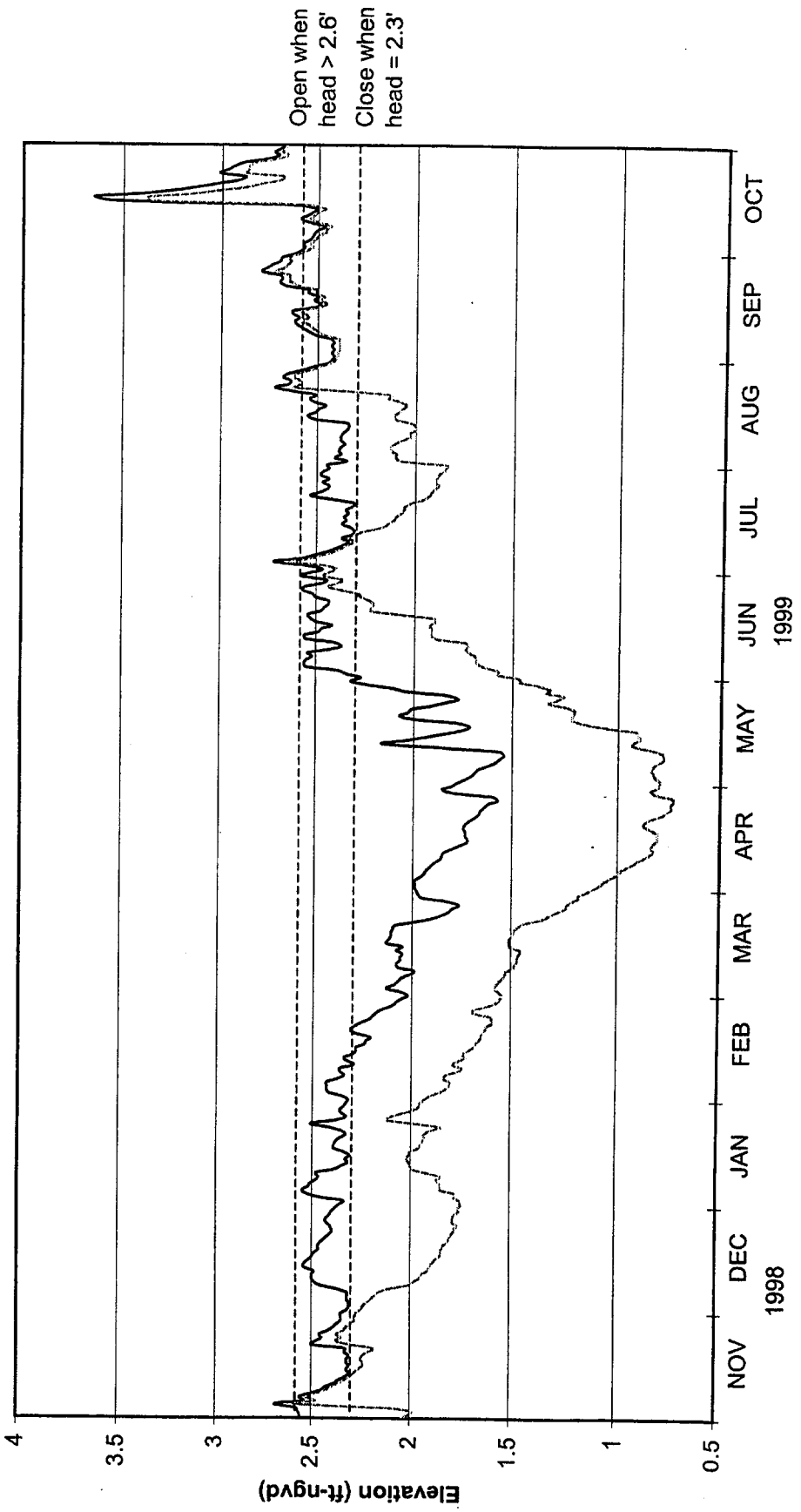



**Figure 81. S-18C Average, Average Daily Stage Levels, Headwater and Tailwater, Year Four Test 7**

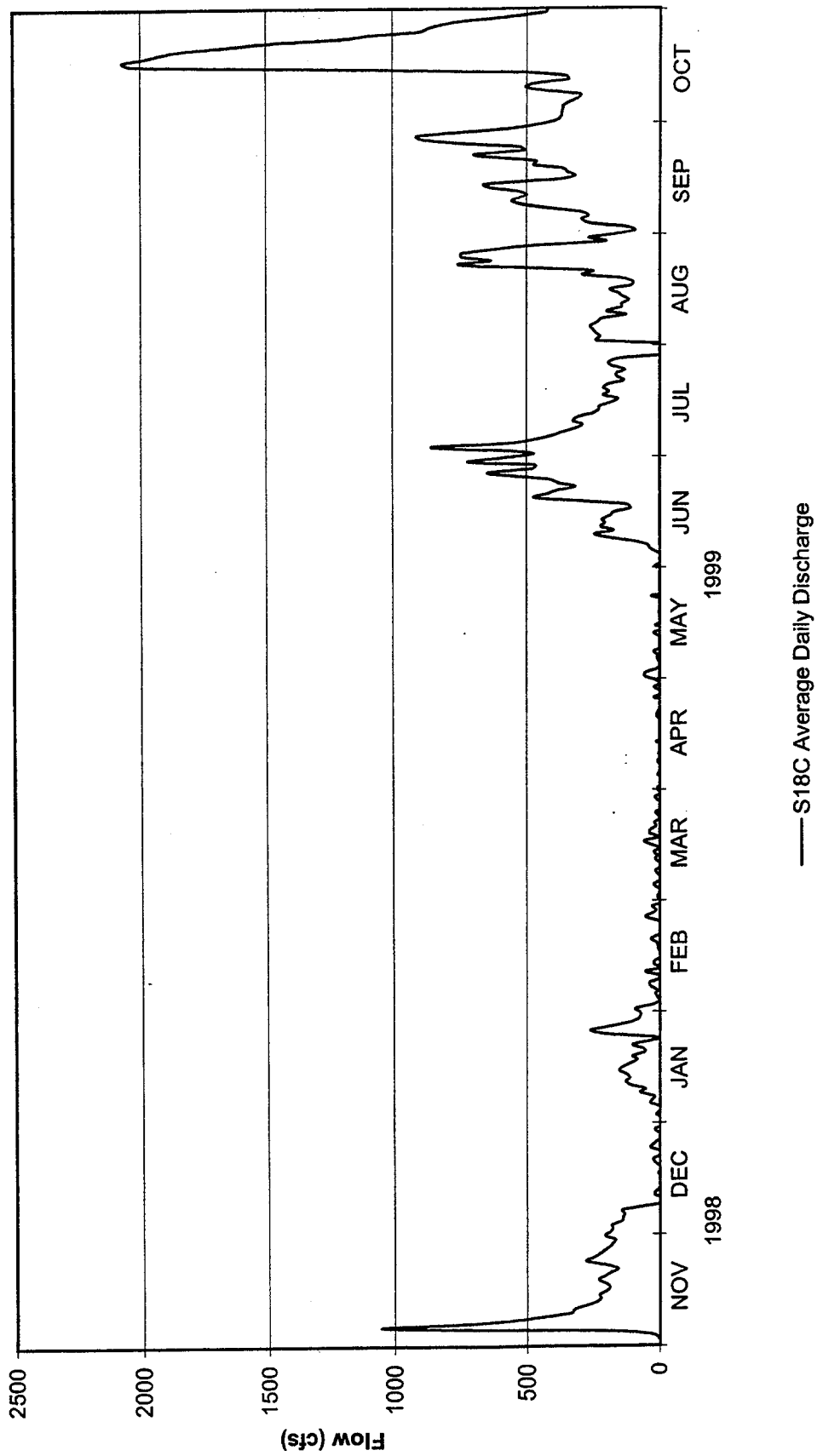



**Figure 82. S-18C Season Average Stage Levels, Daily Flow in CFS, Year Four Test 7**

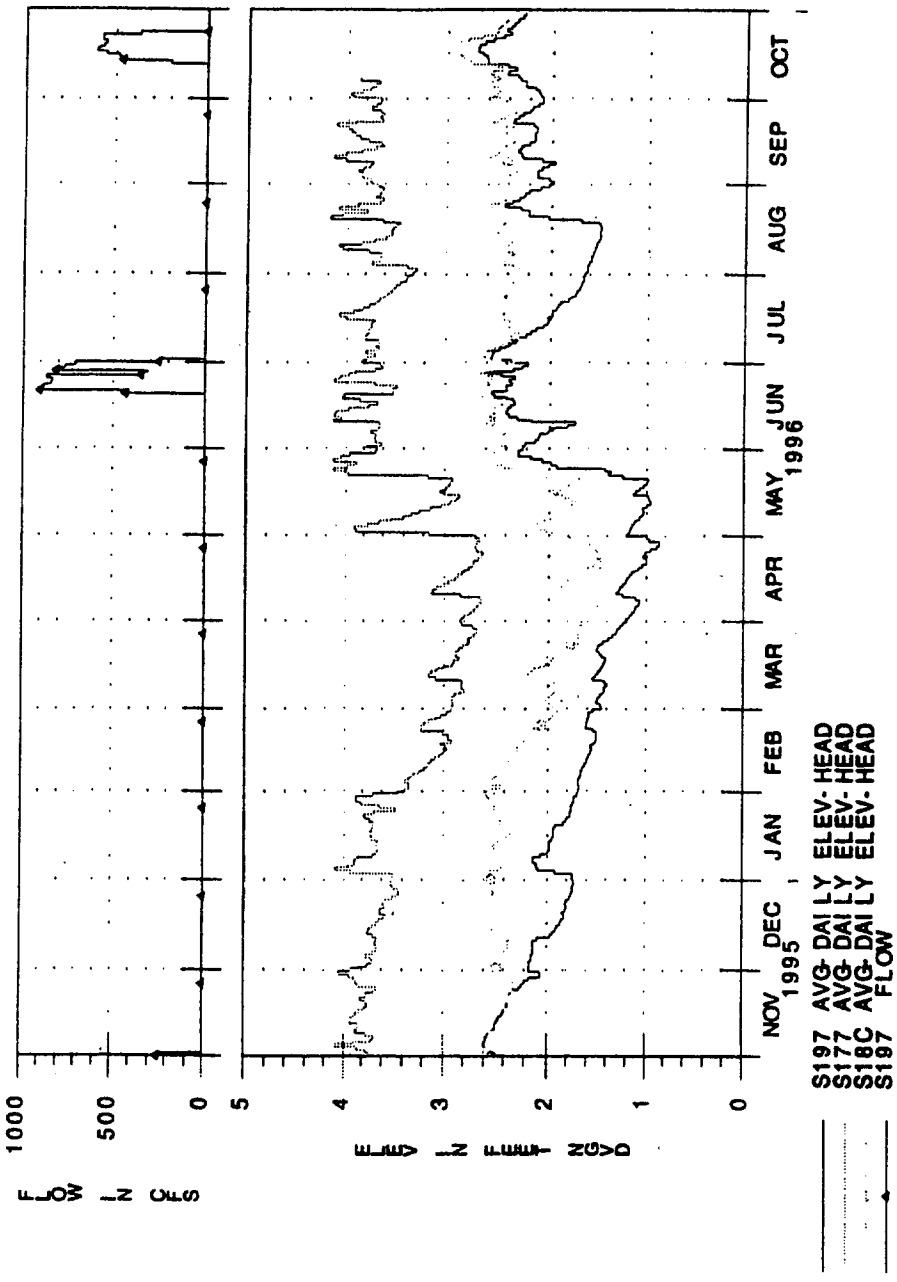



**Figure 83. S-177, S-18C and S-197 Average Daily Stage, Year One Test 7**

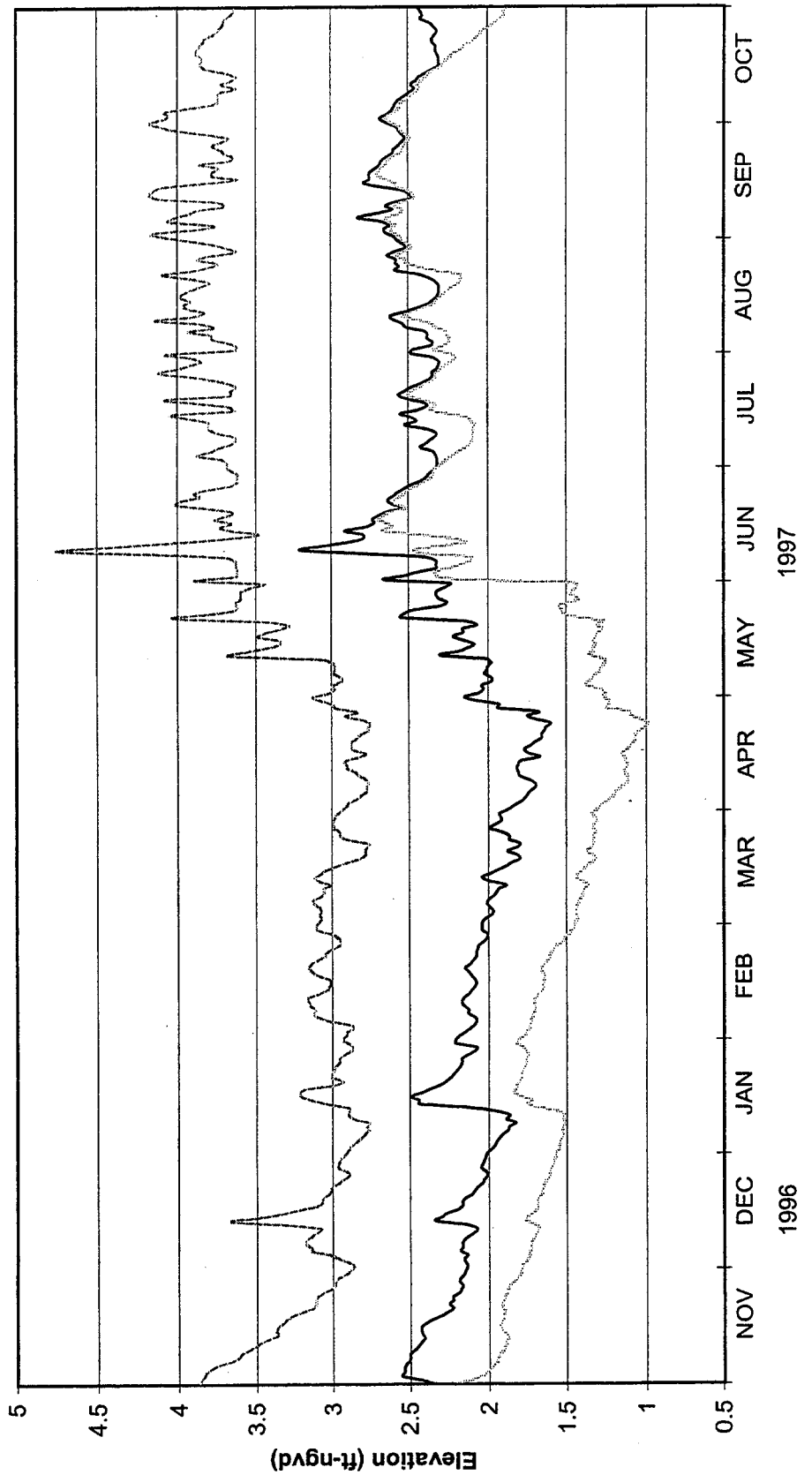



**Figure 84. S-177, S-18C and S-197 Average Daily Stage, Year Two Test**

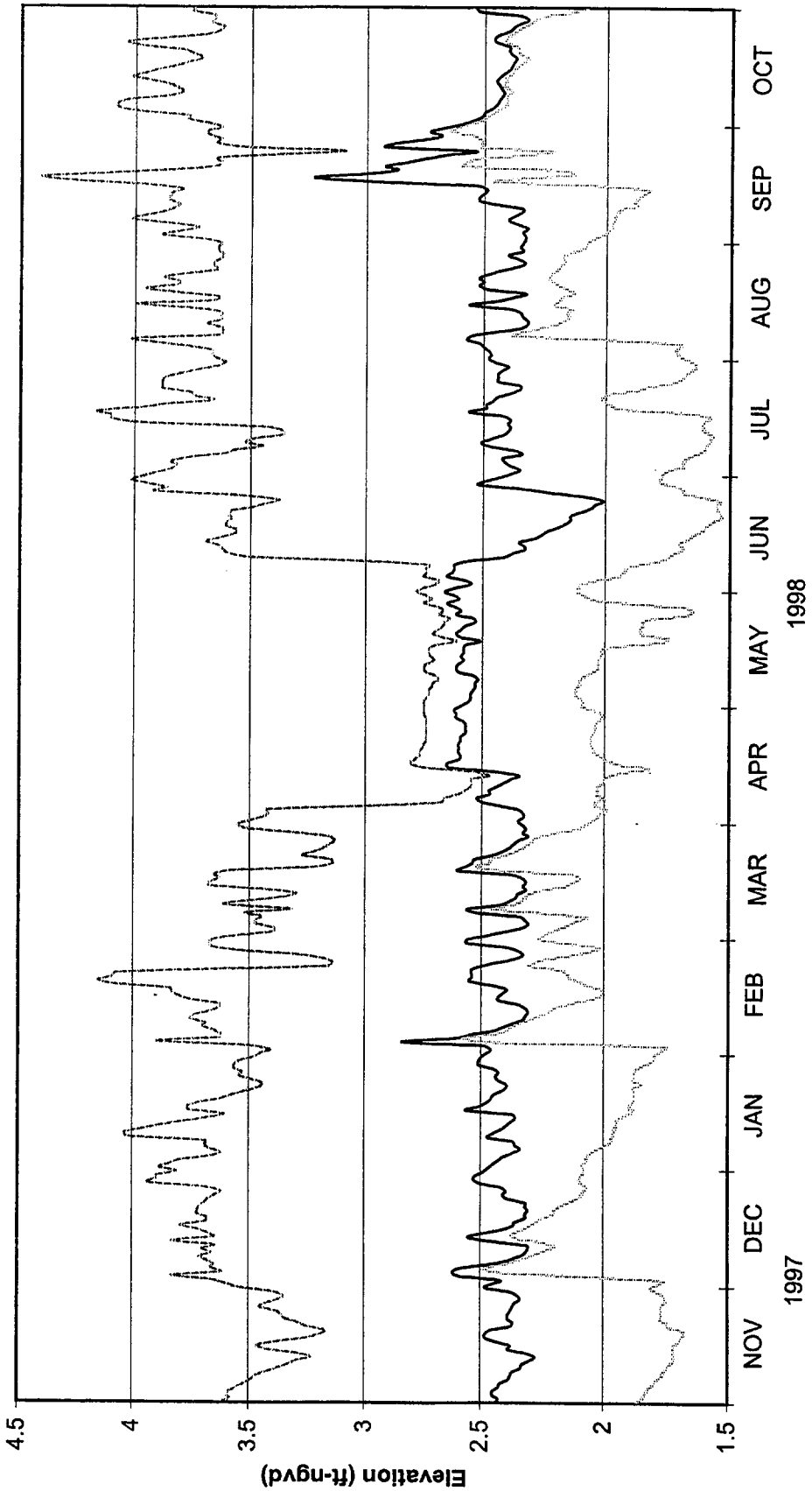



**Figure 85. S-177, S-18C and S-197 Average Daily Stage, Year Three Test 7**

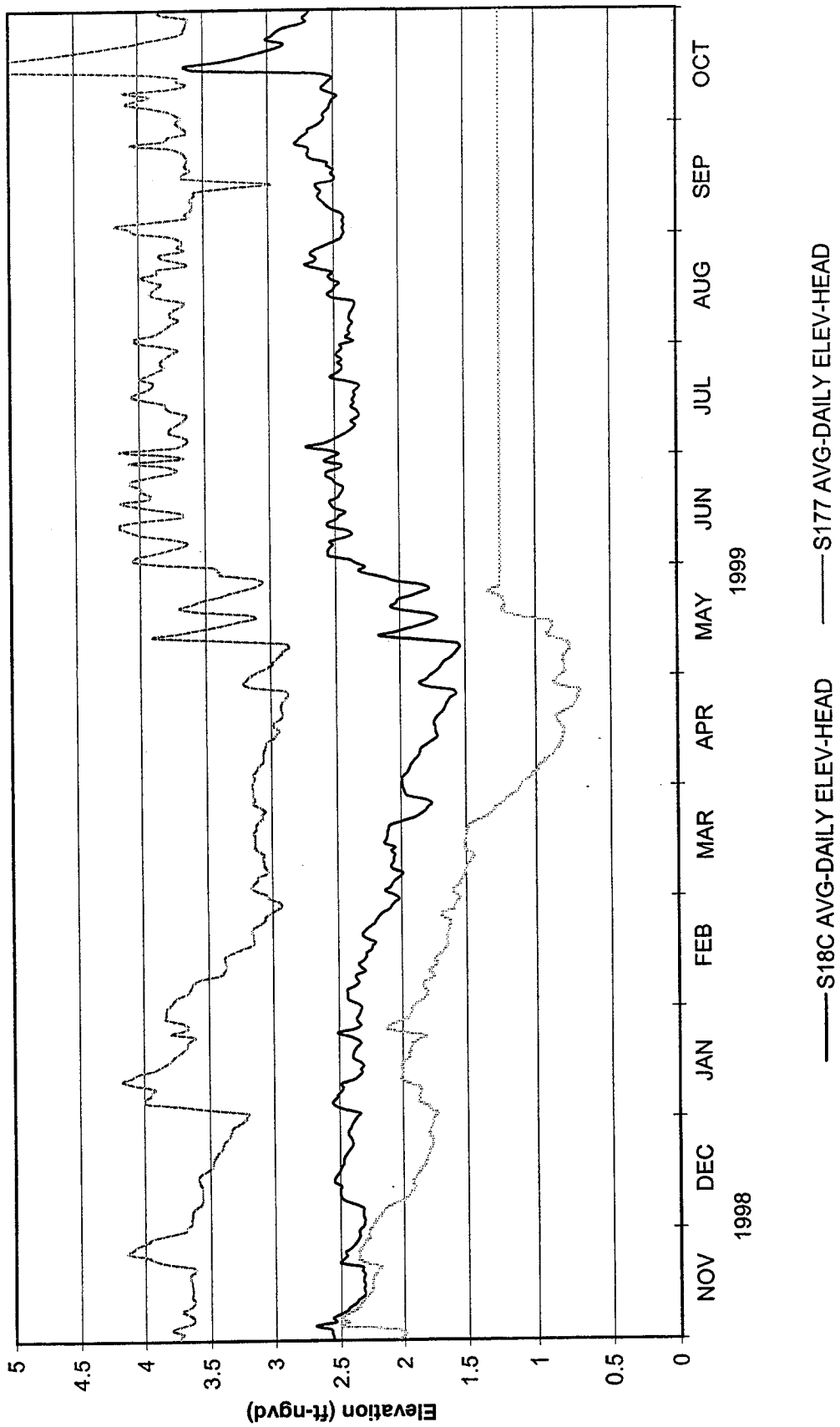



**Figure 86. S-177, S-18C and S-197 Average Daily Stage, Year Four Test 7**

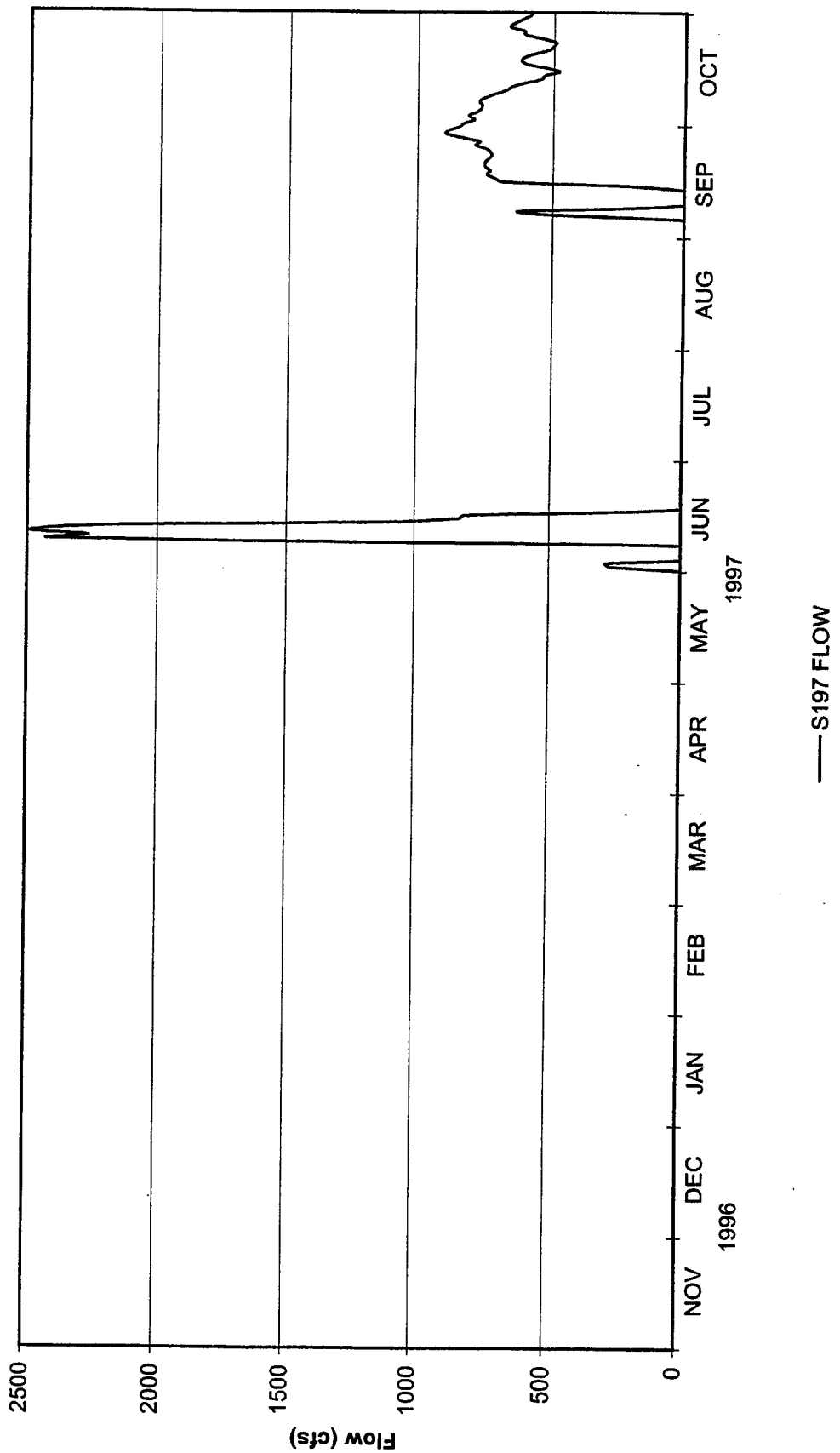



**Figure 87. S-197 Average Daily Flow in CFS, Year Two Test 7**

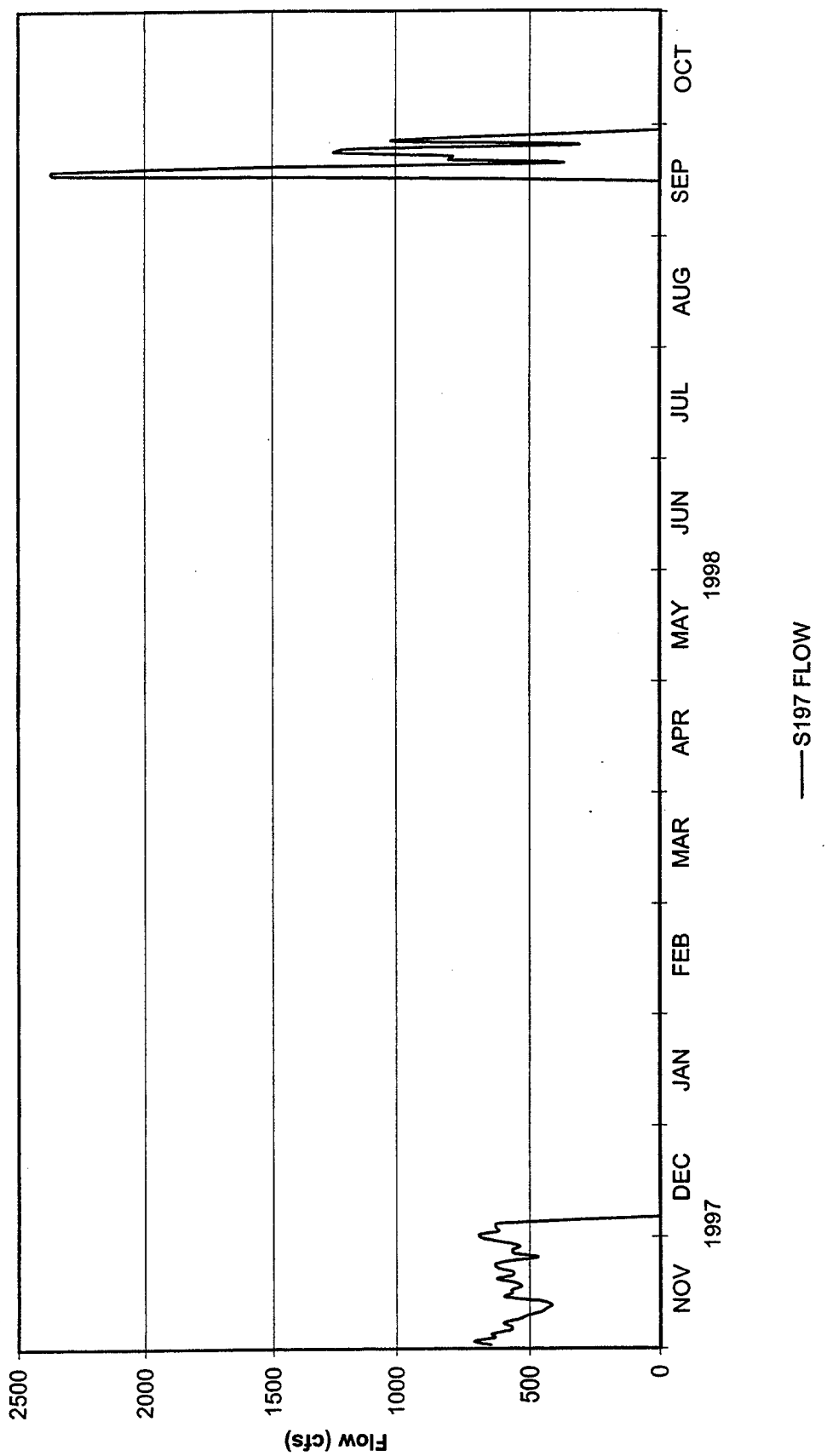



**Figure 88. S-197 Average Daily Flow in CFS, Year Three Test 7**

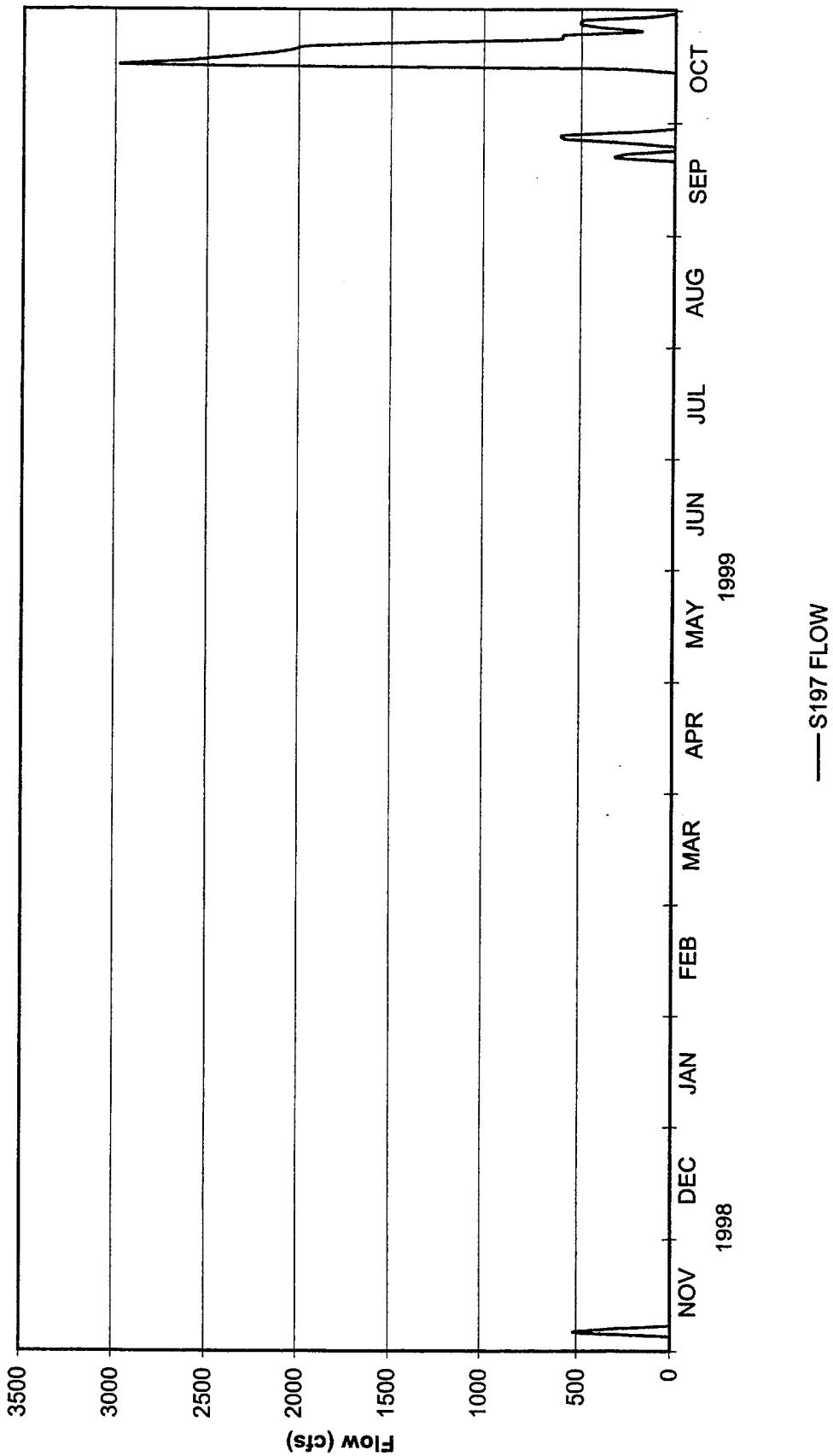



**Figure 89. S-197 Average Daily Flow in CFS, Year Four Test 7**

## Table 16. S-177 Headwater Monthly Average and Seasonal Average Stage Levels

| S-177 HW | November | December | January | February | March | April | May | Average | June | July | August | September | October | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year One | 3.8 | 3.6 | 3.65 | 3.18 | 2.9 | 2.8 | 3.5 | 3.35 | 3.8 | 3.6 | 3.75 | 3.8 | 3.6 | 3.71 |
| Year Two | 3.39 | 3.1 | 2.95 | 3.05 | 3.0 | 2.81 | 3.30 | 3.09 | 3.8 | 3.79 | 3.80 | 3.86 | 3.81 | 3.81 |
| Year Three | 3.35 | 3.72 | 3.70 | 3.70 | 3.35 | 2.8 | 2.72 | 3.33 | 3.37 | 3.79 | 3.75 | 3.78 | 3.88 | 3.71 |
| Year Four | 3.80 | 3.45 | 3.78 | 3.30 | 3.10 | 3.02 | 3.30 | 3.39 | 3.92 | 3.80 | 3.82 | 3.70 | 4.02 | 3.85 |

NOTE: Year One = 1995
Year Two = 1996
Year Three = 1997
Year Four = 1998

## Table 17. S-18C Monthly Average and Seasonal Average Stage Levels

| S-18C HW | November | December | January | February | March | April | May | Average | June | July | August | September | October | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year One | 2.5 | 2.5 | 2.5 | 2.3 | 1.95 | 1.70 | 2.0 | 2.21 | 2.6 | 2.5 | 2.5 | 2.5 | 2.7 | 2.56 |
| Year Two | 2.37 | 2.12 | 2.15 | 2.13 | 1.93 | 1.80 | 2.2 | 2.10 | 2.6 | 2.4 | 2.48 | 2.65 | 2.4 | 2.51 |
| Year Three | 2.39 | 2.44 | 2.40 | 2.42 | 2.40 | 2.50 | 2.58 | 2.45 | 2.35 | 2.43 | 2.42 | 2.65 | 2.43 | 2.46 |
| Year Four | 2.46 | 2.45 | 2.37 | 2.28 | 2.0 | 1.80 | 1.90 | 2.18 | 2.48 | 2.42 | 2.50 | 2.60 | 2.85 | 2.57 |

NOTE: Year One = 1995
Year Two = 1996
Year Three = 1997
Year Four = 2000

# Agricultural Impacts

# AGRICULTURAL IMPACTS

## TEST 7 BACKGROUND

Test Iteration 7 of the Experimental Water Deliveries Program indicates that operating criteria for S-18C, S-174, and S-176 were raised to limit seepage of groundwater and to optimize rainfall-based deliveries to Everglades National Park at Taylor Slough. These changes would cause levels to rise in L-31N and C-1111 canals, which both have adjacent lands in agricultural production.

Data from one rainfall gage and several well sites throughout the agricultural areas were analyzed. Canal stages at the structures nearest to the well sites were also analyzed. Precipitation amounts, groundwater levels, and canal stages from the first year of Test 7 operations were compared to historical data available. Four historical periods were chosen: (1) the pre-drainage period prior to 1968 (pre-drainage), (2) the period 1968 to 1982 following completion of the South Dade Conveyance System (South Dade Conveyance), (3) the period 1982 to 1993 after the start of the Experimental Program of Water Deliveries (Experimental Program), and (4) the Test 6 period from 1993 to 1995 (Test 6). No data were available for the pre-drainage period at the selected sites, and some sites did not have data available for later periods as well. All data were analyzed based on the hydrologic year of November through October. Rainfall, canal level, and well stage data were calculated on a seasonal basis using a November through May dry season and a June through October wet season.

## RAINFALL

Precipitation data from the Homestead Field Station were analyzed. Average total rainfall by season for the entire period of record (1968-1996) was compared to total seasonal rainfall for the four years of Test 7. A rainfall characterization scheme is presented in Table 3 (page 8). Table 18 (page 140) shows that the Year One Test 7 wet season rainfall was characterized as "normal" while the Year One Test 7 dry season was characterized as "dry" relative to the entire period of record available. The dry and wet season rainfall totals from the 1994-1995 hydrologic year were also analyzed as an indicator of antecedent conditions. The dry and wet season rainfall for 1994-1995 were characterized as "wet" relative to the period of record, indicating wet antecedent conditions.

## GROUNDWATER ELEVATIONS AND CANAL STAGES

Several wells were selected for analysis based on their proximity to agricultural areas and their available period of record. The canal stages judged to be most closely associated with each of these wells were also selected. Figure 1 (page 5) shows the location of the wells and stages that were analyzed. The canal stages were recorded as daily averages that were used to compute wet and dry season averages. The well data were recorded as daily maximum values, from which the monthly maximum values were selected. Seasonal averages were computed from the monthly maxima. Average stages for the historical periods were computed as the mean of the seasonal averages for all years within that period.

The canal and well stages were analyzed for trends in the Test 7 values compared to the period of record. The changes in stage were not tested for statistical significance since the population of Test 7 values includes only one number each for the wet and dry seasons. However, the standard

deviations associated with the average historic seasonal stages were computed to provide a basis for judging the relative size of any changes in stage observed between Test 7 and the historic periods. The changes in stage that were observed may not be significant and may not represent genuine trends in the data.

**North of S-176**

Data for the locations north of the S-176 structure are included in Table 19 (page 140). The headwater (HW) stage at S-176 and tailwater (TW) stage at S-331 in the L-31N canal were selected for comparison to wells S-196A, G-789, G-3437, G-1363, Rutzke, and Humble.

Table 19 shows that while the dry season canal stages and well levels in Test 7 dropped slightly from Test 6, they were uniformly higher than during the South Dade Conveyance and Experimental Program periods. The differences in canal levels were all greater than the standard deviation of the period of record values, indicating possible significance. Eight of the 15 well level changes calculated were also greater than the period of record standard deviation. The antecedent wet season, characterized as "wet" compared to the period of record, may have contributed to higher canal and well stages during the dry season of Test 7. However, the Test 7 dry season was characterized as "dry" compared to the period of record, and could be expected to counter the effects of the prior wet season.

Table 20 (page 140) shows that the Test 7 wet season canal stages dropped slightly from Test 6. Levels in five of the six wells also dropped slightly, but the level in G-1363 increased almost half a foot compared to Test 6. Both of the canal stage changes were greater than the associated standard deviation, but only the decrease at the Humble well was greater than the standard deviation. Of this group of wells, G-1363 is the furthest from a canal and therefore possibly the least impacted by changes in canal levels. The canal and well levels increased during Test 7 at all locations compared to the South Dade Conveyance and Experimental Program periods. However, only one of these nine well level changes was greater than the standard deviation, suggesting that the well level changes observed may not be significant.

**Comparison of Test 7 to 1982 and 1989**

Another approach to evaluating changes during Test 7 is to compare the Test 7 conditions to conditions during previous years with similar rainfall patterns. This helps to minimize the effects of rainfall on the observed well and canal stage differences. An examination of the rainfall records for the Homestead Field Station turned up two years within the period that well and canal records are available that had somewhat similar seasonal rainfall totals. Table 21 (page 141) summarizes the rainfall totals for Test 7 and the years 1982 and 1989. The year 1982 is the best comparison with a "wet" antecedent wet season, a "wet" dry season, and a "normal" wet season. Overall, the 1982 conditions are somewhat wetter than Test 7. The 1989 conditions are drier than Test 7 so that lower canal and well stages may be expected for this year, but 1989 was included because it was the best fit during the years that all wells and canals had recorded stages. While these two years are not an exact fit to Test 7, they are the best match available. Table 22 (page 141) summarizes the stage data for the canal location studies. The Test 7 canal stages are uniformly higher than both the 1982 and 1989 stages. The average difference between Test 7 and 1989 stages at all canal locations is 0.55 feet for

the dry season and 0.62 feet for the wet season. The 1982 stage is available only at S-176HW where Test 7 was more than a foot higher during the dry season, and the wet season showed no difference.

Well stages for Test 7, 1982, and 1989 are given in Table 23 (page 142) for the eight selected locations. Again, the well stages are uniformly higher for Test 7 than for either 1989 or 1982. The average Test 7 stage increase at all wells for the dry season is 0.76 feet relative to 1989 and 0.42 feet relative to 1982. The average Test 7 stage increase at all wells for the wet season is 1.21 feet relative to 1989 and 0.31 feet relative to 1982.

Recorded stages for 1989 were consistently the lowest, which is expected since this was the driest of the three years being compared. However, 1982 was the wettest of the three years, yet Test 7 had higher stages in all selected canals and wells. This suggests that the Test 7 operations may play a role in the tendency toward higher groundwater levels.

## POTENTIAL FOR CROP DAMAGE DUE TO FLOODING

Groundwater levels are of critical importance to agricultural producers because inundation of the root zone can negatively impact crop production. The well stages discussed above are indicators of the groundwater level throughout the agricultural region.

Table 24 (page 142) summarizes the Test 7 well levels relative to the ground surface and root zone bottom for six of the wells analyzed. The well data are based on the maximum monthly values during Test 7. A 24 inch deep root zone was assumed based on cultural practices in South Dad County for both vegetable and tree crops. The wells are arranged top to bottom in the table by approximate location from east to west. The potential for flooding clearly increases from east to west. This is expected due to higher ground elevations to the east and higher water levels maintained in Everglades National Park to the west.

The two wells furthest west and closest to the L-31N canal, G-789 and G-3437, experienced water levels during Test 7 that exceeded the root zone bottom. Maximum daily water levels at G-789 were above the root zone bottom during 47 days of the Test 7 wet season. Well G-3437 had maximum daily water levels above the root zone bottom during every month of Test 7, and the maximum daily level was below the root zone for only 38 days. Maximum daily water levels at G-3437 were above the ground surface during five days in the Test 7 wet season.

The areas adjacent to these two wells had potential for flood damage to any agricultural crops present. The area around G-789 experienced root zone inundation only during the wet season, therefore vegetable crops would not have been impacted and only tree crops were at risk. The area around G-3437 (which is located on the border of Everglades National Park) experienced root zone inundation year around and, therefore, all crops in this area were at risk of flooding.

Test 7 water levels for the remaining four wells in the eastern area remained below the root zone bottom. These data indicate no risk of flooding in the areas adjacent to the S-196A, G-1363, G-864A, and G-613 wells during the first year of Test 7.

## SUMMARY

Year One of Test 7 was characterized by a "dry" dry season and a "normal" wet season according to precipitation records. Year One was preceded by a "wet" wet season and "wet" dry season. Analysis of canal stages at four locations and well levels at eight locations shows that all average dry season canal and well levels decreased slightly relative to the averages for Test 6. However, the average dry season canal and well levels increased at all but one location relative to the South Dade Conveyance and Experimental Program periods. The wet season data generally show similar trends. The canal and well stage changes were compared to the standard deviations of the POR average seasonal stages as a simple measure of the Test 7 stage change significance. Several canal and well stage changes exceeded their associated standard deviations during the dry season at the locations north of S-176. The wet season at the north locations as well as both the wet and dry seasons at the locations south of S-176 had very few Test 7 stage changes that exceeded the standard deviations, suggesting limited significance of these changes.

The overall decrease in stages from Test 6 to Test 7 may be explained by the wet/wet seasons in 1995 (Test 6) and the dry/normal seasons in 1996 (Test 7). Higher stages would be expected as a result of wet 1995 year. Some increase in dry season canal and well stages during Test 7 compared to the South Dade Conveyance and Experimental Program periods may be attributable to the preceding "wet" year, however the dry season well level data show a long term trend of increasing over the historic period. Although Test 7 wet season well levels are consistently higher than the South Dade Conveyance and Experimental Program periods; there is no obvious long-term trend in the wet season well level data.

The changes in well stage noted during the first year of Test 7 operations are not necessarily a direct result of Test 7 operations and may be due to other factors. No attempt was made to determine if the noted changes in well stages were statistically significant since only one year of Test 7 data were available. This analysis-identified trends in the Test 7 data compared to the period of record, but does not establish their significance, or identify Test 7 operations as the causative factor.

For Test 7, years Two, Three, and Four, it is assumed that the average canal levels (monthly) for the dry seasons and wet seasons when compared to Year One Test 7 can be characterized as "normal, dry, or wet" simply by comparing average for canal levels for the dry season and wet season for Test 7 years Two, Three, and Four. Using this to approach it was determined that the dry season average water level for S-176 headwater for Year Two was a little drier than Year One Test 7 which was characterized as "dry." The dry season stage averages for Test 7 years three and four were very similar to Year One. In summary the dry season average stage levels indicate that the dry season could be characterized as "dry." The wet season comparison for S-176 headwater is very similar to the dry season analysis, in that the average water levels compares closely with Year One, and since Year One Test 7 was characterized as normal then years Two, Three, and Four can be characterized as normal.

### North of S-176

Tables 19 and 20 (page 140) are taken from the Draft Monitoring Report for Year One Test 7. The headwater (HW) stage at S-176 and tailwater (TW) stage at S-331 and well S-196Afor

Test 7 years Two, Three, and Four are added to the data already in tables 19 and 20. Since the average values for Test 7 years are very close to the Year One Test 7 data in the tables, the analysis of this section (the agricultural section) is not changed and the three additional years adds to the conclusions presented in the draft monitoring report for Year One Test 7. The Test 7 Iteration years one, two, three, and four show higher average water levels as compared to South Dade Conveyance and the Experimental Program. The difference between Test 7 and Test 6, while in the same direction (Test 7 less than) is not significantly less. This conclusion (that Test 7 water levels are lower than Test 6) is not as conclusive as the South Dade Conveyance and Experimental Program being less than Test 7.

**Comparison of Test 7 to 1982 and 1989**

The draft Monitoring Report for Year One Test 7 included a section titled as above. The effort identified two previous years with rainfall patterns similar to Year One Test 7 rainfall. The rainfall station was Homestead Field Station and the two years were 1982 and 1989. 1982 was described as "the best comparison with "wet" antecedent wet season, a "wet" dry season, and a "normal" wet season." This description of 1982 is the same as the description of Year One Test 7. However, the description does go on to say that overall, the 1982 conditions are somewhat wetter than Year One Test 7. "The 1989 conditions are drier than Test 7 so that lower canal and well stations may be expected for this year, but 1989 was included because it was the best fit." Table 21 (page 141), seasonal rainfall totals from the draft Monitoring Report for Year One Test 7, is included to show the rainfall summary. Table 22 (page 141), seasonal average canal stages in feet, NSVD for Test 7, 1989 and 1982 is added but modified to include Test 7 years Two, Three, and Four. As is clearly evident the dry season and wet season years Two, Three, and Four average stages are very close to Year One Test 7 average stages for S-176 headwater and S-331 tailwater, therefore the previous analysis is not really changed even with three additional years. The last sentence in this section of the Monitoring Report was as follows. "This suggests that the Test 7 operations may play a role in the tendency toward higher groundwater levels." Test 7 years Two, Three, and Four were very similar to Year One Test 7.

## POTENTIAL FOR CROP DAMAGE DUE TO FLOODING

Table 24 (page 142) summarizes the Year One Test 7 well levels relative to the ground surface and root bottom for six of the wells analyzed. The well data is based on the maximum monthly values during Year One Test 7. The wells are arranged top to bottom in the table by approximate location from east to west. The potential for flooding clearly increases from east to west. Higher ground elevations are to the east and higher water levels in the Everglades are to the west.

The two wells furthest west and closest to the L-31N Canal, G-789 and G-3437, experienced water levels during Year One Test 7 that exceeded the root zone bottom. Figure 90 (page 143) shows the daily maximum water level at G-789 during Year One Test 7. The closest controlling structure or structures on L-31N would be S-174 and S-176. Average daily water levels at S-176 do not show the spikes going up to as much as 5.5 feet, NGVD. For Year One the average stage level for the dry season is 4.57 feet, NGVD and the wet season average stage level is 4.72 feet, NGVD. The use of the daily maximum water levels in well G-789 may show a worse scenario that is really not present. Also the graph in Figure 90 does not follow the S-176 stage hydrograph (S-174 and S-176 stage

levels are virtually the same) very well, and the S-176 stage hydrograph (HW) represents L-31N Canal. Test 7 years Two, Three, and Four closely resemble Year One Test 7. Year Two Test 7 is a little drier than Year One in the dry season. It is likely that the same conclusion regarding days above the root zone could be applied to years Two, Three, and Four, however it is a little gray as to whether G-789 is following water levels in L-31N. Figure 91 (page 144) shows again the maximum daily water levels at G-3437 during Year One Test 7. As the figure shows the water level in the well was above the root zone most of the year. It is, however, not possible that his well is solely influenced by water levels in L-31N (G-789 well is to the east of L-31N and G-3437 is to the west and further north). The G-3437 well is still located in the reach of L-31N between S-331 and S-176/S-174. The water level in L-31N is controlled by S-174/S-176 and the water level hydrograph produced by S-174/S-176 is below 5.0 feet NGVD with exceptions from extreme events. The G-3437 well stage hydrograph is above 5.0 feet for a majority of the year. This is not reflective of L-31N Canal levels. These levels are, however fairly close to levels at G-3273 (which is used to control S-333 discharges into Northeast Shark Slough). The stage at Angels Well located to the east of G-3273 exhibits a similar hydrograph as G-3272 and G-3437, therefore G-3437 is more influenced by conditions in the Shark Slough area than it is from L-31N Canal. As far as comparisons between the wells and Year One Test 7, this serves as a representative of Years Two, Three, and Four, which as stated several times, these three subsequent years are very similar to Year One and therefore there should not be great differences between the years at any of the structures, canals, or wells since all four years had the same operating criteria.

In summary the four years of Test 7 were not different from Test 6, at least for S-176 headwater and S-331 tailwater. If there was a difference it could have been slightly greater than Test 6 because of the wet conditions in the mid-1990s. The four years of Test 7 were higher than either South Dade County or Experimental Program.

**Table 18. Homestead Field Station Rainfall for Year One Test 7 Relative to Period of Record, February 1968-October 1996**

| Season | Year One Test 7 Rain | | | 1994-1995 Rain | | |
|---|---|---|---|---|---|---|
| | Inches | Percent POR | Category | Inches | Percent POR | Category |
| Dry | 14.62 | 71.25 | Dry | 25.35 | 123.54 | Wet |
| Wet | 38.20 | 95.29 | Normal | 58.57 | 146.1 | Wet |

**Table 19. Test 7 Dry Season Canal and Well Level Changes From Historic Periods, in Feet, Wells North of S-176**

| Historic Period | Change In Canal Stage (Ft) | | Change In Well Level (Ft) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | S-176HW | S-331TW | S-196A | G-789 | Rutzke | Humble | G-1363 | G-3437 |
| Test 7 Stage Year One | 4.57 | 4.72 | 3.8 | 3.98 | 4.99 | 4.63 | 4.24 | 5.87 |
| South Dade County | +1.77 | * | +0.76 | +0.69 | * | * | +0.98 | * |
| Experimental Program | +0.71 | +0.72 | +0.29 | +0.3 | +0.9 | +0.45 | +0.45 | +0.98 |
| Test 6 | -0.10 | -0.15 | -0.45 | -0.34 | -0.05 | -0.49 | -0.54 | -0.31 |

*Data not available

NOTE: S-176 HW 4.12, 4.5, 4.4 feet respectively Test 7 Years Two, Three, and Four
S-331 TW 4.3, 4.88, 4.68 feet respectively Test 7 Years Two, Three, and Four

**Table 20. Test 7 Wet Season Canal and Well Level Changes From Historic Periods, in Feet, Wells North of S-176**

| Historic Period | Change In Canal Stage (Ft) | | Change In Well Level (Ft) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | S-176HW | S-331TW | S-196A | G-789 | Rutzke | Humble | G-1363 | G-3437 |
| Test 7 Stage Year One | 4.7 | 4.94 | 5.12 | 5.18 | 5.58 | 5.71 | 5.8 | 6.71 |
| South Dade County | +0.27 | * | +0.42 | +0.05 | * | * | +0.67 | * |
| Experimental Program | +0.42 | +0.38 | +0.44 | +0.26 | +0.3 | +0.36 | +0.63 | +0.55 |
| Test 6 | -0.07 | -0.20 | -0.12 | -0.22 | -0.15 | -0.27 | +0.48 | -0.09 |

*Data not available

NOTE: S-176 HW 4.79, 4.72, 4.81 feet respectively Test 7 Years Two, Three, and Four
S-331 TW 5.04, 4.87, 5.09 feet respectively Test 7 Years Two, Three, and Four

**Table 21. Seasonal Rainfall Totals in Inches at Homestead Field Station for Test 7, 1989 and 1982**

| Year | Antecedent Wet Season | | Dry Season | | Wet Season | |
|---|---|---|---|---|---|---|
| | Total | Class | Total | Class | Total | Class |
| Test 7 | 57.33 | Wet | 15.41 | Dry | 33.71 | Normal |
| 1989 | 47.1 | Wet | 10.99 | Very dry | 30.14 | Dry |
| 1982 | 58.11 | Wet | 23.29 | Wet | 38.88 | Normal |

**Table 22. Seasonal Average Canal Stages in Feet, NGVD for Year One Test 7, 1989 and 1982**

| Canal | Year | Dry Stage | Wet Stage |
|---|---|---|---|
| S-176 HW | Test 7 | 4.57* | 4.7 |
| | 1989 | 3.8 | 3.91 |
| | 1982 | 3.44 | 4.69 |
| S-331 TW | Test 7 | 4.72* | 4.94 |
| | 1989 | 3.95 | 3.99 |
| S-178 HW | Test 7 | 2.3 | 2.76 |
| | 1989 | 1.99 | 2.48 |
| S-178 TW | Test 7 | 2.21 | 2.53 |
| | 1989 | 1.87 | 2.06 |

*See tables 19 and 20 for Test 7 Years Two, Three, and Four companion stages.

**Table 23. Seasonal Average Well Stages in Feet, NGVD For Year One Test 7, 1989 and 1982**

| Well | Year | Dry Stage | Wet Stage |
|---|---|---|---|
| S-196A | Test 7 | 3.8 | 5.12 |
| | 1989 | 3.03 | 3.72 |
| | 1982 | 3.28 | 4.75 |
| G-1363 | Test 7 | 4.24 | 5.8 |
| | 1989 | 3.34 | 3.97 |
| | 1982 | 3.44 | 5.42 |
| G-789 | Test 7 | 3.98 | 5.18 |
| | 1989 | 3.2 | 4.37 |
| | 1982 | 3.61 | 5.07 |
| G-613 | Test 7 | 2.45 | 3.34 |
| | 1989 | 2.14 | 2.88 |
| | 1982 | 2.19 | 3.15 |
| G-864A | Test 7 | 2.56 | 4.48 |
| | 1989 | 2.13 | 3.26 |
| | 1982 | 2.41 | 3.98 |
| Rutzke | Test 7 | 4.99 | 5.58 |
| | 1989 | 3.67 | 4.62 |
| Humble | Test 7 | 4.63 | 5.71 |
| | 1989 | 3.89 | 4.2 |
| G-3437 | Test 7 | 5.87 | 6.71 |
| | 1989 | 4.04 | 5.23 |

**Table 24. Minimum Differences Between Monthly Maximum Test 7 Well Levels and the Ground Surface and Root Zone Bottom**

| Well | Ground Surface-Maximum Well Level (ft) | Root Zone Bottom-Maximum Well Level (ft) |
|---|---|---|
| S-196A | +4.56 | +2.56 |
| G-1363 | +3.04 | +1.04 |
| G864-A | +3.26 | +1.26 |
| G-613 | +2.23 | +0.23 |
| G-789 | +0.79 | -1.21 |
| G-3437 | -0.11 | negative all months |

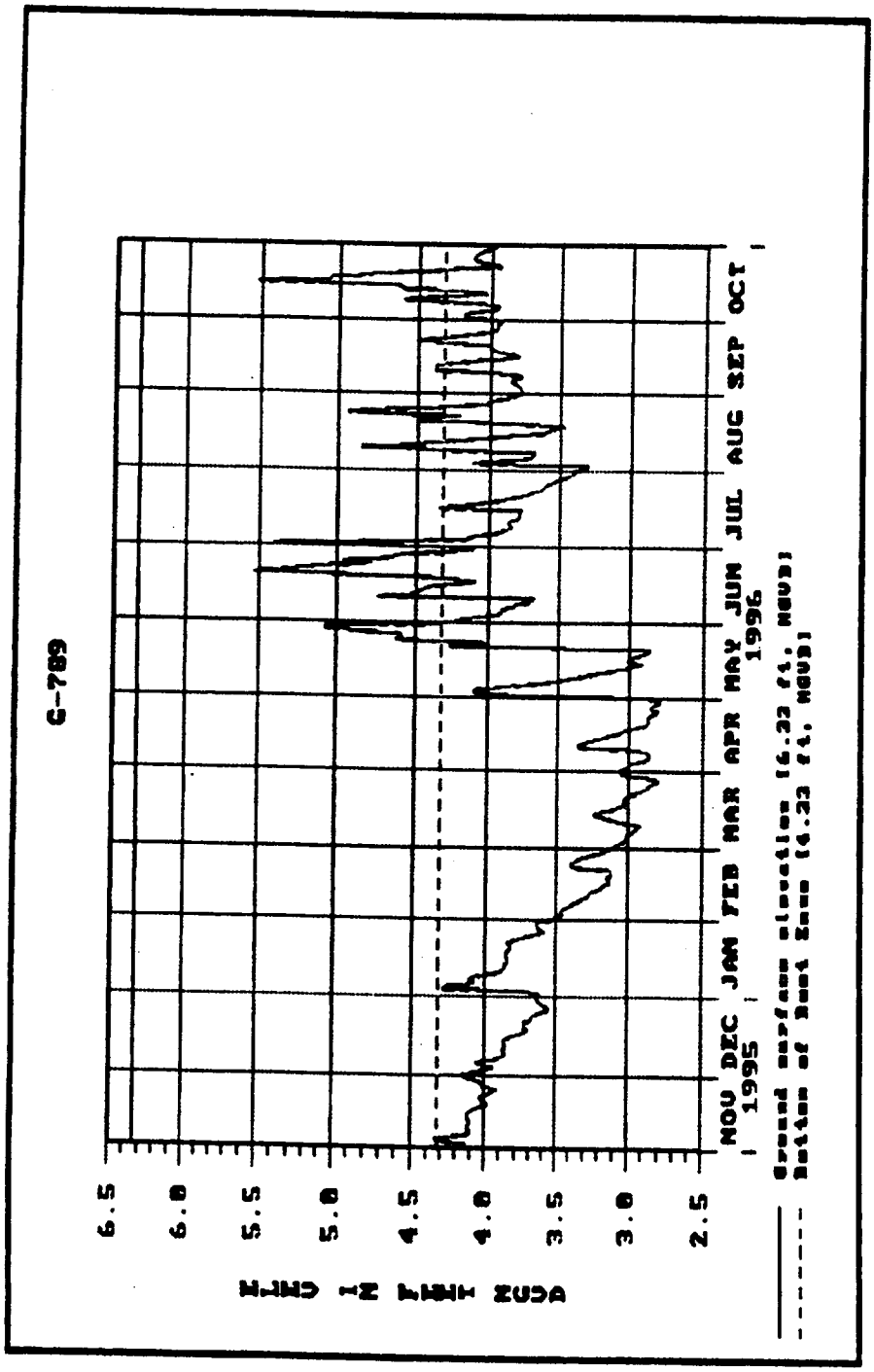



**Figure 90. Daily Maximum Well Levels with Ground Surface Elevation and Root Zone Bottom Elevation at G-789 During Test 7**

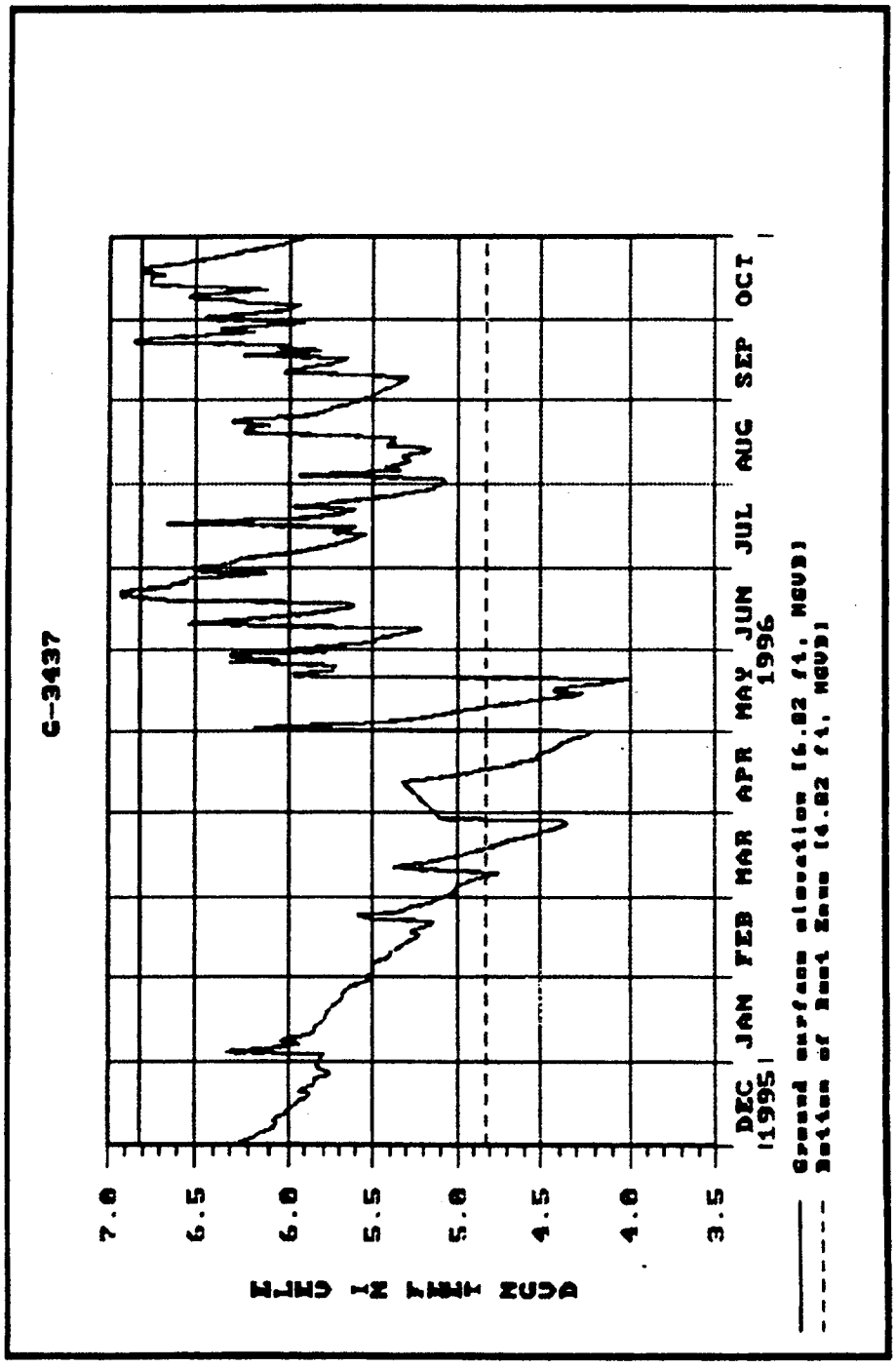



Figure 91. Daily Maximum Well Levels with Ground Surface Elevation and Root Zone Bottom Elevation at G-3437 During Test 7